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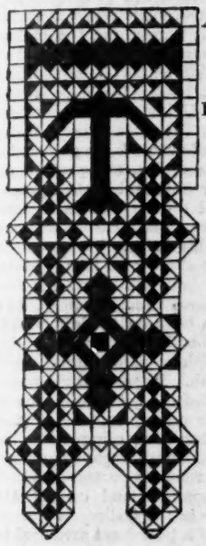
ILLUSTRATIONS.

The Corn Exchange, London.—Messrs. I'Anson & Son, Architects 770
The Piccadilly Art Galleries (with Plans, 777).—Mr. Edward Robert Robson, Architect 772
Rome: Excavations in the Forum Romanum; The Velia 774, 775
Entrance Doorway of the Casa dels Grallas, Barcelona 779

CONTENTS.

Ancient Mosaic Pavements in the British Museum 757
Sepulchral and Memorial Architecture 759
Some Considerations connected with the Mode of Building Practised in Russia 761
The United Arts Gallery 762
The Hamilton Palace Collection 762
A Tunnel under the St. Lawrence 763
Bringing the Sea to Manchester 763
The Oak in History, Art, and Handicraft 765
Cork Cathedral 766
Competition for the New House of the German Imperial Parliament 766
The Falling Mountain at Elm 766
Birmingham Architectural Association 767
Sales of Shares in various Public Companies: Value of Gas Shares 767
A New Workhouse for Wandsworth and Clapham 767
A Chat about Rockwork 767
The Corn Exchange, London 768
The Roof of the Corn Exchange, Mark-lane 768
The Piccadilly Art Galleries 781
Rome: Excavations in the Forum Romanum 781
Entrance of the Casa dels Grallas, Barcelona 781
The Right of Vendors to Keep the Purchase-money of a Building destroyed by Fire as against an Insurance Office 781
The Sale at Kensington House 782
The Oxford Military College, Oxon 782
The Meteorological Society 782
The South-Eastern Railway Company and their Bridges in South London 782
Strawberry Hill: Visit of the Architectural Association 783
Proposed New Public Buildings at Middlesbrough 784
Proposed Lunatic Asylum for Exeter 784
Sale of a Building Site in Bastcheap 78
Building Patents 78 5
The Moistening of Air in Factories 78 5
Prisoners' Earnings 7 5
St. Peter's Hospital, Henrietta-street, Covent Garden 78 5
A Fireproof Cement 785
Cleaning Tiles 785
Obtaining Tenders from Builders 786
Building Contracts and Bills of Quantities: Hughes v. Owen 78 6
Building at Tottenham: Wright v. Childs 78 6
Stained Glass 786
The Blacksmith's Art 787
"Washable Walls" 787
Explosion with Electric Lights 787
Paving Apportionments: Allum v. Dickinson 78 7
Miscellanea 787



Ancient Mosaic Pavements in the British Museum.

THERE are few, if any, classes of Roman or Græco-Roman antiquities that possess a fine-art character which command more attention, or illustrate more points of interest, than the beautifully tessellated pavements still surviving in the museums of Europe. The British Museum contains, in the Greek and Roman department, between seventy and eighty pavements, or parts of pavements and mosaics, and in the department of British Antiquities several additional specimens are preserved, so that the total number of these artistic relics is not far short of 100. Of these, some were bequeathed, together with other Classical antiquities, by Sir William Temple; the Pourtales Collection contributed to the series, but the excavations conducted by Mr. C. T. Newton, C.B., at Budrum, the site of Halicarnassus, of which an illustrated notice was published in 1862-3, under the title of "History of Discoveries at Halicarnassus, Cnidus, and Branchidæ," yielded a considerable number; and in the years 1856-8 the Rev. Nathan Davis, during the progress of excavations carried on by him at Carthage and Utica, on behalf of the authorities of the British Museum, discovered a large number of mosaic pavements, of which many are now repaired and exhibited on the basement floor in the rooms at the south-west angle of the Museum, beneath the Græco-Roman Gallery, and the Archaic Greek room. The pavements which excavations in England have added to these, are not placed with the foreign examples, but they have been mounted in rectangular frames and placed only temporarily, we trust, in somewhat incongruous positions on the walls of the gallery which contains the iconic Roman busts leading from the entrance-hall in a westward direction to the Egyptian Gallery. These come from Withington and Woodchester, in Gloucestershire; Abbots Ann, in Hampshire; the site of the Bank of England; and Threadneedle-street, in the City of London. Their subjects will be discussed further on, but in details of design, construction, and material they differ in no respect from those which come from the Greek and African sites already mentioned. It may, perhaps, be a subject of remark why the Museum is so insufficiently represented in this class of Romano-British art remains, but it must be borne in mind that the difficulty of transporting large surfaces composed of loose tesseræ, the difficulty of finding suitable positions for them in the already closely packed area of the British department in the Museum, sufficiently evidenced by hanging up several pavements over the busts and sarcophagi in the Bust Room, and the yet greater difficulty of prevailing upon the owners of the land whereon these tender antiquities are found to part with their treasures, all operate adversely to the acquisition of any very great or fine series of Romano-British mosaics. Hence it is that the celebrated pavements at Woodchester, Cirencester, Bramdean, and Bignor, those at Brading, Leicester, Itchen Abbas, and almost every Roman station of importance, still remain in their original sites,—some, indeed, walled in and roofed over, more or less protected from destructive weather and iconoclastic visitors, but by no means so secure as when the soft covering of mould shrouded them from the eyes of the too curious and the often too aggressive antiquary. There is little doubt that all pavements of this class, with very few exceptions, are slowly perishing for want of intelligent care and judicious treatment. For example, we may mention that which exhibits the Orphic myth at Cirencester, where in spite of a roofed protection, a considerable number of the cubes or tesseræ are loosened from the pavement, the surface is very uneven, and gradual deterioration has been noticed to be setting in, which can only result in the total loss of one of the finest antiquities of its kind in England. The Museum authorities have done much to preserve their pavements by placing the upper surfaces downwards on a flat slab, and being thereby enabled to get at the concrete in which the tesseræ are embedded. When by this means the pavement has levelled itself, and the concrete has been adjusted or renewed, and a hard bed thus made, it would be difficult indeed for any part of the pavement to sink out of the level again. Many of our finest pavements still *in situ* require instant attention in this respect, but we are aware of no machinery by which their owners can be prevailed upon to execute the necessary work. Of the age of many of the pavements found in Britain much conflicting evidence has been recorded, but even at the late period when the Saxons had established themselves in the island, the Roman pavements must still have been in perfection, and their influence on Saxon ornamental art may be traced in many of the details of their monuments, such as crosses, architecture, and manuscripts, and even on those of the Normans after them. The mode of constructing tessellated floors was preserved by the ecclesiastics to a comparatively late period, as Continental specimens testify. At St. Omer, according to Mr. Roach Smith, a fine specimen of the date of the twelfth century is preserved, of which the details and fabric are closely copied from Roman prototypes in every respect except that the subjects are Scriptural, surrounded by the signs of the Zodiac. We believe that Mr. Thos. Morgan, F.S.A., is preparing a calendar of all the pavements hitherto recorded on British sites; such a work will be one of extreme usefulness to the antiquary.

The subjects upon tessellated pavements are naturally very diverse, but they seem to fall easily into a few groups or classes, such as, 1, mythological and legendary; 2, hunting scenes and animal representations; 3, birds; 4, water scenes and fish; 5, ornamental and geometrical devices. Let us see how far the British Museum collection of mosaics will illustrate these classes. And, first, we will consider the pictures derived from the mythology of Greece and Rome. The Halicarnassus pavement (No. 5 of the Museum numeration) is 12 ft. wide by nearly 41 ft. long, terminating in a semicircular apse. The subject is a group representing the water goddess Amphitrite among dolphins and fish. On either side of her is a Triton, holding up drapery stretched behind her, their heads being surmounted by the claws of shell-fish. The goddess is clad with a mantle cast over the right thigh, but is otherwise undraped. In the right hand is a mirror which reflects her face, with her left she smooths her tresses. This is an attitude not far removed from the conventional pose of the Mediæval mermaid, of whom, perhaps, Amphitrite is the prototype. On the head is a golden-coloured fillet; the mantle is of an olive grey, and the drapery held by the attendant Tritons olive grey with yellow and red stripes. The bluish-grey background is evidently intended to represent the watery element over which the goddess shed her lustre. The border is intricate and harmonious. The mythic being, the Triton, is a favourite subject; he appears in another pavement (No. 69), wreathed about the head, and holding a dish of pomegranates and a shepherd's crook: here again dolphins and fish are introduced as accessories; the colouring is rich and harmonised, and the whole enclosed in a guilloche border of red tesseræ, shaded delicately through orange into white. This fine pavement, 5 ft. by 8 ft., was discovered by Mr. Wood, at the Temple of Diana of Ephesus. Another (No. 63) represents a swimming Triton wreathed and mantled, and with a dish of fruit and crook as before, looking back at a companion Nereid, who is seated upon a fold of his fishy tail, on which also she rests the left hand. In the right hand she holds a drinking-horn. She wears a red *peplos*, armlets, and bracelets. Blue dolphins with red fins disport around this animated group, which, now measuring about 4 ft. by 7 ft., has originally formed part of a larger mosaic of which the border is composed of flowers and knots. Carthage contributes another Tritonic pavement (No. 46), nearly 4 ft. by 12 ft., where two groups are repre-

sented; in the first a wreathed Triton extends his hand towards a facile Nereid, seated on his tail, and drawing forward a sea-green veil, which swells out with the breeze behind her head. Round her body is a yellow mantle, ornamented with blue and red stripes. The second group is imperfect, but not very dissimilar to that already mentioned. Here again we meet the accessory dolphins, which, according to the Greek canon of art, are introduced to represent the surroundings of the scene. The water is artistically indicated by broken black lines on a white ground. The border or frame, also on a white ground, shows the guilloche plait, and the embattled ornament, the colours being red, pink, yellow, black, blue, and green. Another Nereid is seen on No. 64, on white ground, with border of foliage in company with a Hippocamp, who bears the watery beauty on his tail and holds out a *patera*, or bowl, to his fair rider. In his hand is a red crooked stick, and on his shoulders a *chlamys*, or mantle; she wears a mantle, too, and her head is bound with a diadem. The ancient reparation of this mosaic with a fragment of another pavement representing fish and waves, is of interest. Of marine deities, No. 68, nearly 6 ft. by 7 ft., presented by Mr. Hudson Gurney in 1844, shows a head conjectured to be that of Glaucus. The seaweed green of the hair, the curling plant-like beard, and the dark green lines on a white ground below the chin of the figure, representing waves, are worthy of notice. The head of a marine god appears also, between dolphins, on a fragment from Withington, in Gloucestershire, presented by Mr. H. C. Brooke in 1812, in the gallery of Roman busts. A mask of the youthful Dionysus, with long hair bound with a diadem, from a mosaic medallion (No. 30) found in 1856 in a large Roman villa at Halicarnassus, and a fine pavement (No. 20), about 4 ft. 6 in. square, from the same site, on which is the youthful god wreathed with ivy and wearing a red scarf bordered black, accompanied with the usual emblem, a panther, illustrate the Bacchus myth, and perhaps come from rooms destined to convivial meetings. The same villa contained No. 19, a spirited picture in tesseræ of Europa, wreathed, and girt about the lower limbs with a "mantle blue," standing to the right, beside the tawny bull of Jove, whose body is marked with crimson and white. Another room of this richly-decorated villa supplies three fragments (Nos. 6, 7, and 8), representing Meleager and Atalanta engaged in hunting. They are riding at full speed from opposite directions towards the centre of the picture, to attack a lion and leopard. On the left hand, Atalanta, clad in the tightly-fitting yellow Amazonian jerkin and buskins, a red *chlamys* flying from the shoulder, and armed with quiver and bow, aims at an advancing lion; she is mounted on a dark blue horse. Meleager, on the right hand, in blue cloak and tunic of green and white stripes, thrusts his spear into a panther which is attacking him. A border of black wavy pattern on white enclosed this subject, the original dimensions of which were 15 ft. 6 in. by 7 ft. A mask of Medusa's head, a not uncommon subject of classical ornamentation, is seen on No. 22; the mask is full faced, dark red, the eyes, nose and mouth heightened with white; two concentric rings encircle it, from the outermost of which black pointed leaves radiate on a white field. This measures 3 ft. and comes from the same site. On the sea-shore of Carthage part of a large mosaic pavement was found (No. 44), measuring about 4 ft. by 7 ft., the subject of which probably relates to some public games. A figure of Victory is seen flying through the air, holding a large rectangular label, on which are eight lines of an inscription in Roman capital letters, white on red ground. The goddess wears bracelets, a red and white robe, and an over garment, black bordered, reaching to the hips. Terror personified is shown on No. 21, as a wild shaggy head encircled by leaves radiating from it, on a white ground, the hair yellow, shades of red for the face, and red, blue, green, white, and black for other parts. This is over 5 ft. square, and comes from the Halicarnassus Villa. Another similar subject, No. 39, gives yellow hair with black shading to the dread visage, the eyes being picked with white. Both of them are probably from the centre of an *ægis*, or buckler, on which the heads of Terror or of Medusa were frequently portrayed, in order to cause dismay to the opponent, a custom no doubt surviving from the barbaric ages of Greece. The Temple collection gives another pavement to the Museum series. This is a mosaic, now made into a table-top (No. 70), supported by a pillar on which are sculptured in relief two Mænades and as many Satyrs moving wildly under the influence of orgiastic frenzy. The subject is spirited and full of life, though treated in the conventional way and replenished with the accessories of such scenes, with which most of us are familiar. At Halicarnassus, Mr. Newton found in the villa a medallion mosaic, 1 ft. 9 in. diameter, with a female bust in tessellation, representing a personification of the city of Halicarnassus (No. 18), and inscribed with that name. The head is encircled with a crimson-coloured *stephane* or diadem. On the breast light blue drapery bordered with black cubes is shown, having two parallel vertical stripes of orange-coloured tesseræ down the breast. Representations of the seasons may aptly terminate this first sub-division of pavimental subjects. They are favourite designs with the artist; many such subjects have been discovered and recorded not only in England, as at Cirencester, for example, but all over the ancient Roman empire. From the prolific site of Halicarnassus comes a fragment, 2 ft. 8 in. square, representing Spring, personified as a youthful girlish bust (No. 9), whose long hair flows down the neck, the drapery being a dark red tunic, fastened on each shoulder by a circular brooch; from the ears depend a pair of earrings. The name of Spring, in Greek capitals, was inscribed in small cubes above her head. Another female bust of Spring from Carthage is at the corner of No. 42, her hair gathered over the forehead in a topknot, earrings in her ears, and her dress a white *chiton* or smock, with purple stripe on the right shoulder, and a red mantle thrown over the left shoulder. Summer season is also represented on the Museum pavements in two examples, the first (No. 10), from Halicarnassus, is a female bust with long flowing tresses crowned with ears of corn; the other, from Carthage (No. 43), a female bust wreathed about the head with ears of wheat, and wearing hooped earrings, a golden-coloured torque, a white *chiton* with yellow stripes on the right, and a red mantle over the left shoulder. The month of March is depicted in a Carthaginian tessellation of more than ordinary interest, for it illustrates a well-known pavement at Cirencester, which is adorned with a corresponding subject. This fine pavement in the British Museum (No. 41) exceeds in measurement 6 ft. by 7 ft. Here March is personified as a female figure leaning against a square *cippus* or altar, on which she rests the right hand. She turns towards another *cippus* on the right on which are two cups, and beyond it, at the extreme right of the subject there is a tree in the foliage of which there is a swallow, towards which she is pointing with the forefinger of the left hand, thus indicating the approach of spring. In like manner, the pavement found in Dyer-street, Cirencester, in 1849, has a figure of Flora, on whose shoulder the swallow, "harbinger of spring," is vividly and faithfully displayed. In this Corinian Flora nothing could better symbolise spring than the ruby-gemmed flowers with which the head of the figure is adorned. They heighten the effect. They are composed of tesellæ of a bright ruby-coloured glass, the only instance of the use of this material in the Cirencester pavements, but, as we shall show by-and-by, a not uncommon material for the richer sort of tessellations found in Continental examples. In this Museum pavement there are shown a bronze-coloured bucket, with a green branch across it, and containing a white liquid, either water or milk; the personage wears an under tunic, green-bordered at the wrists, a saffron-coloured garment with hanging sleeves, and a green mantle with a purple lining. At her side is a plant growing in a two-handled vase, yellow shaded into red, and on each side of the vase foliage of an arabesque kind. April's changeable month is given on No. 42, a female, with a voluptuous expression, playing the castagnets. She may, perchance, represent one of the Gaditanian damsels, famed of old, as now also, for their skill in dancing. On the right is a circular *cippus*, on which is a little statue, perhaps of Venus (for does not Love hallow the April of Life), with a leafy bower behind it. This is a charming piece of tesseral art, full of poetry and feeling. It measures 6 ft. 9 in. by 10 ft. 6 in. Then comes ripe, matronly July (No. 46), another female, picking a mulberry with a stylus, daintily, from a dish of that fruit (which ripens in July), placed on a *cippus* under a mulberry tree. Over her green *chiton*, reaching to the heels, is a salmon-coloured garment with hanging sleeves, green striped with black and red. Last of the series comes November, a female too, holding a *sistrum* or musical rattle in the right, a *situla* or bucket of libations in the left hand, her sleeved undergarment is green, over it a yellow and white dress, the hair ruddy with a flaxen yellow topknot. We may place at the end of this class No. 29, a youthful male mask, with long hair wreathed, in a medallion.

The second class, that of hunting scenes and animal representations, is not quite so numerously represented in the British Museum collections. In Nos. 11, 12, two fragments of the same illustrative design,—an ibex, of bluish-grey, speeding to the right, is pursued by a hound of similar colour, with a red collar; another dark red hound, flecked with black, rushing forward, heads the quarry. No. 47, a rudely-made mosaic from Carthage, of the size of nearly 4 ft. by 9 ft., has for its design a mounted huntsman at full speed to the right, cheering on his dark blue dog towards a lost game; at the right an orange tree, laden with fruit; behind are tall plants and the broken lines of the rugged countryside. The dress of the hunter is a red jerkin with a black and white side stripe, and black boots; the horse is of a drab colour. From Utica another hunting scene is derived (No. 65), measuring 5 ft. by 11 ft. Within a fence of network are gathered a wild boar, a stag, a roe, fox, and panther, an ostrich, and two other birds, all in their proper colours; at each end of the net is a boat manned by two hunters, naked, except that one has a cloth around his loins. The scene is evidently laid near the shore of a lake or river, the ground is white, besprinkled with a few green sprigs; in the foreground are two lizards and a tree; near the boat, on the left, which, like the other one, has a sharp prow and stern, blue-black and red, with a yellow streak from end to end, are two fish. These water-hunters are hauling in the end of the net so as to narrow the space in which the quarry is enclosed. It is an animated and interesting glimpse into the sports of the past. On another pavement, not yet numbered, in this room, is portrayed a hare coursed by a greyhound; and one of the Withington pavements in the Gallery of Roman portraits shows part of a boar-hunt arranged in a circle, with an outer border of birds. The animal forms which naturally fall into this second group consist (some in addition to those already described) of the lion, leopard, panther, horse, stag, bull, goat, dog, and deer. On four the lion occurs; in two of them the monarch of the beasts is rushing to his prey,—a bull and goat,—at full speed to the right (Nos. 13, 14). In front of him in each case is a tree. The colours of these lions are yellow, red, blue, white, and black. Their form and design may be contrasted by the artistic student with those of the lion of the Orphic pavement at Cirencester, the one spell-bound under the musical numbers of the master's lyre, the other masterful, rampant, and full of life, in quest of his prey. Almost the same colours are employed in each case, but differently arranged. The leopard and lion in the scene of Meleager and Atalanta have been already pointed out; so, too, the panther of Dionysus. The horse is seen in No. 1, where a wounded horseman is lying on a truck by the side of his charger, perhaps a part of a pavement representing the games of the circus. This came from the Pourtales collection. Another fine Carthaginian pavement, not yet numbered, in the inner room, shows a horseman successfully lassoing a stag, at full speed, to the right. The stag is seen, not only on this pavement, but on one of the tesselated pavements found at Withington, and now on the wall of the gallery. A stag and deer drinking by a fountain may be seen on No. 47, from Carthage. The Jovian bull of Europa we have already noticed. Dogs are not uncommon, in many attitudes, and of various hues. The goat occurs in No. 48, where two are springing forward to the right; one is pierced in the side, the blood falling to the ground. They are fawn-coloured, shading into grey, with black outlines. It is a late and coarsely-made pavement from Carthage.

Bird pictures form the third class of our division. On nearly twenty of the British Museum pavements they occur as subordinate accessories. They are mostly of the domesticated kind, if we except the ostrich which is found in the drawnet scene; the eagle, a favourite military symbol, strange to say, does

not appear to occur. The medallions of the Halicarnassian villa comprise a duck, cocks, and other birds on branches (Nos. 23-26, 28); a bluish-grey bird, with wings, crest, and legs red, holding a twig in the beak (No. 31). A francolin is given in No. 48, the scene of the wounded goat, speckled blue, yellow, and red. A peacock, guinea fowl, and other birds occur in No. 67; the brightly-coloured tesseræ, probably glass, of many of these birds seems to have been in ancient times purposely picked out of the pavement. It is from Utica, and some part of its design may be compared with the gorgeous peacocks of the Cirencester pavement. There is a drinking peacock in a fountain scene (No. 49). Ducks and pigeons occur on some pavements not yet numbered in the lower room; and some birds are found on two British pavements in the Bust Gallery. Our next class comprises fish and fishing scenes.

Perhaps these subjects adorned baths and bathing-rooms. The fish are not only subordinate to more pretentious scenes where they are used to indicate locality, but frequently occur alone as the principal element of the composition. Just as we have already pointed out, in our recent notice of the archaic Greek vases in the Museum, objects of marine origin entered largely into the ornamentation of the early pottery of a people so pre-eminently maritime in their proclivities as the Greeks, so here also, in pavements which, as a rule, must be attributed to a late period of classical art, the dolphin in Nos. 5, 15, 16, 46, 53, and others, as well as in one of the Withington pavements; the long-snouted wrass and the sword-fish (No. 4); the *dentex* and the *sparus* (No. 27); a deep-bodied thick fish (No. 33); a red and yellow perch and black and purple lobsters (No. 51); the *muræna*, prawns, tunny, wrass, eel, sea-perch, and lobster, fallen from a fish-basket, all in natural colours finely shaded (No. 52); the red and the grey mullet, dolphin, *dentex*, and wrass (No. 66), and several others present themselves to the visitor as he makes the circuit of the room. Water-scenes and fishermen belong to this class. Boats occur in two pavements from Utica; both examples are of pointed beaks, one has the curving neck and head of a swan for a figure-head (No. 66); over the gunwale hangs a line or the edge of a net. One of the fishermen is raising out of the water a fish which he has hooked. The last class into which we have divided the subjects of the tesselated pavements, that of geometrical and ornamental devices, may be illustrated from almost every existing specimen. These patterns are, in several instances, not subordinated as borders, but they form the whole ground of the design. Many of them, from the strong contrasts of their colour, and others for their subtly-blended shades, stand out as marvels of the application of simple rules of geometry and of rudimentary designs to highly artistic ends. Hence the guilloche twists, cabled borders, threefold and fourfold plaits, mæanders, rosettes, ivy-leaves, quatrefoils, crosslets, and other simple devices, cunningly retained by the true feeling of the artist from the oldest periods, please and gratify the eye that has already feasted upon far more complicated patterns, beyond expression, from their pure simplicity and chasteness, and we must go back 2,000 years to find the origin of patterns which, even to-day, form the stock-in-trade of the designer and colourist. The guilloche pattern is seen to good effect in three pieces of pavement from Abbots Ann, Hampshire, presented to the trustees of the British Museum by the Hon. and Rev. S. Best, in 1854; the spiral, with radiating leaves, in the little bit of the Woodchester pavement, in the same gallery; the plaited border, enclosing a circle in which is a floreated cross, on the right hand of the gallery, in a pavement found on the site of the Bank of England, and presented by the governor and directors of that institution; and an elegant picture of alternate squares and lozenge, enclosing fourfold knots, rosettes, mæanders, and quatrefoils, is preserved on a pavement found in Threadneedle-street, in the City of London, and presented by Mr. E. Moxhay to the authorities of the Museum in 1841. The chequer-pattern, representing rows of parallelopipeds seen in perspective, coloured white, black, yellow, red, and green, is shown in two pavements bequeathed by Sir William Temple (Nos. 2 and 3); squares and lozenges, enclosing a quatrefoil, in No. 37; cubes in diagonal rows, with an embattled border, in No. 59; the lozenge, guilloche, and *pelta*, or Amazonian shield, a very archaic ornament, in No. 5; the guilloche and black-and-white wave pattern in No. 8; guilloche and checky border in No. 45; intersecting circles, green and red, embracing crosses and quatrefoils, in No. 54; ivy-leaves in No. 57; and star and flower patterns in No. 60. Of this class, a fine pavement at Leicester has nine octagonal compartments, enclosing quadrilateral and triangular figures interlaced by a rich guilloche of various colours. It was discovered in 1830, and originally about 24 ft. square. Inscriptions and explanatory words or names occur on several pavements in the Museum collection, but we must leave them to say a few concluding words upon the fabric of the pavements and their component parts.

Many of them rest on a concrete floor carefully prepared upon the natural earth, which was probably beaten hard first of all; others, however, especially when in connexion with hypocausts, rest upon short pillars made of loose courses of tiles or bricks about 1¼ in. thick. Each pillar has a larger tile for a base or plinth, and another of the same size by way of a capital. They stand in rows at irregular distances, some about 1 ft. 6 in., others as much as 2 ft. apart. These capitals are then covered with brick tiles of 2 ft. square, forming a flagged surface, upon which the concrete backing of the pavement itself rests. The antiquary Lysons, who took great interest in these remains, states that the foundation of a pavement which he published in the "Reliquiæ," consisted of rammed gravel, covered to a depth of 6 in. with a concrete composed of gravel, lime, sand, broken tiles, and rubbish. This was covered in turn with 4½ in. of a mixture of pounded brick, lime, and sand, over which were laid the tessellæ about ¼ in. in depth. The materials of the tesseræ themselves have frequently formed the subject of special inquiry. No doubt great care was exercised in choosing choice specimens of coloured stone, marble, and other hard materials from the vicinity of the place where the work was executed. Sometimes, however, materials have been employed which, though excellent in respect of tint, are of so soft and friable a nature that they are not suitable in any other respect. This selection was, perhaps, guided by the effects observed by the designer in a previously drawn and coloured working plan. In shape the pieces vary from about 1¼ in. diameter to a mere chip, and it is this variation in form and size, as well as in contour when the design needed curves, that the work was rendered so free in outline as we frequently see in old pavements; modern imitations are too regular in size, as though the cubes were machine-made. The prepared tessellæ were united to the terrass, or bed, by a firmly-setting cement, of fine lime, so strong in its adhesive qualities that a slab of dry work would fracture as readily through the cubes as at the joined edges. Finally, the surface was polished, and the varying lustres of the various materials contrasted together to heighten the effect of the whole. Of natural colours Buckman found the white to be a chalk; cream colour, a freestone from great oolite; grey, the same after roasting; yellow, oolite and pebbles; chocolate red, old red sandstone; slate and black, from the limestone bands of the lower lias. The artificial colours were light and dark red, and black, from terra-cottas, susceptible of little or no polish; and a transparent ruby colour, of glass, the occurrence of which material in British mosaic pavements is exceedingly rare, although in Continental mosaic by no means uncommon. He concluded that glass was sparingly used in British pavements because only one figure, that of the fine Cirencester Flora, contains it, out of the great number of pavements already excavated. Voelcker's analysis of this glass gives oxide of lead, *protoxide of copper* (in considerable bulk, to give the colour), alumina, oxide of iron, silica, and potash. The use of gold for the ruby colour is believed to have been unknown before the seventeenth century. In one of the British Museum pavements, that of the wounded goat (No. 48), there is a bird on a branch, called a francolin, of which the somewhat small tessellæ are in many instances of glass, of a deep lapis lazuli colour; other birds (No. 67) have glass cubes of turquoise blue; and the fine head of a marine deity (No. 68) has yellow glass or topaz-coloured cubes in the beard, perhaps other gems or glasses as well, which produce a striking effect when awakened into life by a beam of light. Interesting as these pavements are, as monuments of the past, they have, says Mr. Westmacott, a further claim on our attention for the qualities of art which they exhibit, and in this respect they claim a superior place among antiquities. The execution is somewhat coarse sometimes, but this is owing to the nature of the materials and the mode of workmanship. The details and drawing may be rude, but apart from these mechanical and technical defects, there is a style in them which elevates them to the best period of art. Another point of comparative excellence is the quality, breadth, and distribution of their colour; there is a picturesque grandeur about them, a strong love of nature, and a thorough acquaintance on the part of the designer with the full extent of their applicability. Hence their success and esteem in old times, their appreciation and importance as teachers of true art in our modern collections.

SEPULCHRAL AND MEMORIAL ARCHITECTURE.

No one will deny the interest, historically speaking, of the subject of the architectural treatment of sepulchres and memorials of the dead. The desire for such memorials has been developed so early in the civilisation of every nation that the style and character of tombs among each nation have really been, in some cases, among the chief factors of the future architectural style of the same people, and even of others who have succeeded them and developed their ideas. The most remarkable instance of this is to be found in the fact that some of the forms of classic architecture, indeed the most important parts of them, which have been multiplied and repeated *ad infinitum*, and have influenced more or less the architecture of the whole civilised world down to the present day, are drawn from the architecture of rock-cut tombs in Asia Minor, which were themselves drawn from a wooden architecture (probably domestic) that has perished, but as they stand are, nevertheless, the origin of a great portion of the details of the Classic "order." But there is another interest in the subject for the architectural artist, besides the historical one. For the sepulchral monument or memorial, when it approaches to at all a large and elaborate scale, affords an opportunity, seldom afforded now, for architectural design absolutely free from the trammels of practical requirements, for the indulgence of fancy in the attempt to make a thing of architectural beauty of detail and proportion and expression, free from any consideration as to position of windows, or doors, as to general plan or ventilation. The architect who has to design a monument is for once and for the moment free from the prosaic side of his art, and at liberty to play with it as he pleases.

We have used the terms "sepulchral" and "memorial" architecture as having a separate meaning. The class of work we are considering may, in fact, be divided into three heads. The tomb or sepulchre may, in its simplest form, be regarded only as a place of safety for the body, to which so much reverence has often been attached; a stronghold securing it against theft or spoliation by man or beast. The next stage is the decorative treatment of this citadel, so as to make it at once an opportunity of showing honour to the deceased and a memorial of him to the eyes of succeeding generations. Then comes the third stage, when the memorial is entirely separate from the sepulchre, and is a monument pure and simple, an erection to recal the dead to mind and record his achievements, placed in some site where it may be conspicuous, but which might have been inconvenient or unsuitable as an actual place of interment. In this case the sepulchral idea may be abandoned; the monument, that is, may cease to give any idea, in its design and construction, of being the receptacle of the dead, and may take any form and character which, to the designer, appears most suitable and expressive. When the memorial is not separate from the tomb, then the sepulchral idea should always be at least hinted at, so as to preserve the true expression of the actual meaning and function of the erection.

There can be little doubt that the earliest form of sepulchral monument was the mound heaped over the site of the tomb, to mark the place from a distance. This is the most natural and simple manner of making such a monument; and when this form of monument passed first into what could be called an archi-

sented; in the first a wreathed Triton extends his hand towards a facile Nereid, seated on his tail, and drawing forward a sea-green veil, which swells out with the breeze behind her head. Round her body is a yellow mantle, ornamented with blue and red stripes. The second group is imperfect, but not very dissimilar to that already mentioned. Here again we meet the accessory dolphins, which, according to the Greek canon of art, are introduced to represent the surroundings of the scene. The water is artistically indicated by broken black lines on a white ground. The border or frame, also on a white ground, shows the guilloche plait, and the embattled ornament, the colours being red, pink, yellow, black, blue, and green. Another Nereid is seen on No. 64, on white ground, with border of foliage in company with a Hippocamp, who bears the watery beauty on his tail and holds out a *patera*, or bowl, to his fair rider. In his hand is a red crooked stick, and on his shoulders a *chlamys*, or mantle; she wears a mantle, too, and her head is bound with a diadem. The ancient reparation of this mosaic with a fragment of another pavement representing fish and waves, is of interest. Of marine deities, No. 68, nearly 6 ft. by 7 ft., presented by Mr. Hudson Gurney in 1844, shows a head conjectured to be that of Glaucus. The seaweed green of the hair, the curling plant-like beard, and the dark green lines on a white ground below the chin of the figure, represen'ing waves, are worthy of notice. The head of a marine god appears also, between dolphins, on a fragment from Withington, in Gloucestershire, presented by Mr. H. C. Brooke in 1812, in the gallery of Roman busts. A mask of the youthful Dionysus, with long hair bound with a diadem, from a mosaic medallion (No. 30) found in 1856 in a large Roman villa at Halicarnassus, and a fine pavement (No. 20), about 4 ft. 6 in. square, from the same site, on which is the youthful god wreathed with ivy and wearing a red scarf bordered black, accompanied with the usual emblem, a panther, illustrate the Bacchus myth, and perhaps come from rooms destined to convivial meetings. The same villa contained No. 19, a spirited picture in tesseræ of Europa, wreathed, and girt about the lower limbs with a "mantle blue," standing to the right, beside the tawny bull of Jove, whose body is marked with crimson and white. Another room of this richly-decorated villa supplies three fragments (Nos. 6, 7, and 8), representing Meleager and Atalanta engaged in hunting. They are riding at full speed from opposite directions towards the centre of the picture, to attack a lion and leopard. On the left hand, Atalanta, clad in the tightly-fitting yellow Amazonian jerkin and buskins, a red *chlamys* flying from the shoulder, and armed with quiver and bow, aims at an advancing lion; she is mounted on a dark blue horse. Meleager, on the right hand, in blue cloak and tunic of green and white stripes, thrusts his spear into a panther which is attacking him. A border of black wavy pattern on white enclosed this subject, the original dimensions of which were 15 ft. 6 in. by 7 ft. A mask of Medusa's head, a not uncommon subject of classical ornamentation, is seen on No. 22; the mask is full faced, dark red, the eyes, nose and mouth heightened with white; two concentric rings encircle it, from the outermost of which black pointed leaves radiate on a white field. This measures 3 ft. and comes from the same site. On the sea-shore of Carthage part of a large mosaic pavement was found (No. 44), measuring about 4 ft. by 7 ft., the subject of which probably relates to some public games. A figure of Victory is seen flying through the air, holding a large rectangular label, on which are eight lines of an inscription in Roman capital letters, white on red ground. The goddess wears bracelets, a red and white robe, and an over garment, black bordered, reaching to the hips. Terror personified is shown on No. 21, as a wild shaggy head encircled by leaves radiating from it, on a white ground, the hair yellow, shades of red for the face, and red, blue, green, white, and black for other parts. This is over 5 ft. square, and comes from the Halicarnassus Villa. Another similar subject, No. 39, gives yellow hair with black shading to the dread visage, the eyes being picked with white. Both of them are probably from the centre of an *ægis*, or buckler, on which the heads of Terror or of Medusa were frequently portrayed, in order to cause dismay to the opponent, a custom no doubt surviving from the barbaric ages of Greece. The Temple collection gives another pavement to the Museum series. This is a mosaic, now made into a table-top (No. 70), supported by a pillar on which are sculptured in relief two Mænades and as many Satyrs moving wildly under the influence of orgiastic frenzy. The subject is spirited and full of life, though treated in the conventional way and replenished with the accessories of such scenes, with which most of us are familiar. At Halicarnassus, Mr. Newton found in the villa a medallion mosaic, 1 ft. 9 in. diameter, with a female bust in tessellation, representing a personification of the city of Halicarnassus (No. 18), and inscribed with that name. The head is encircled with a crimson-coloured *stephane* or diadem. On the breast light blue drapery bordered with black cubes is shown, having two parallel vertical stripes of orange-coloured tesseræ down the breast. Representations of the seasons may aptly terminate this first sub-division of pavimental subjects. They are favourite designs with the artist; many such subjects have been discovered and recorded not only in England, as at Cirencester, for example, but all over the ancient Roman empire. From the prolific site of Halicarnassus comes a fragment, 2 ft. 8 in. square, representing Spring, personified as a youthful girlish bust (No. 9), whose long hair flows down the neck, the drapery being a dark red tunic, fastened on each shoulder by a circular brooch; from the ears depend a pair of earrings. The name of Spring, in Greek capitals, was inscribed in small cubes above her head. Another female bust of Spring from Carthage is at the corner of No. 42, her hair gathered over the forehead in a topknot, earrings in her ears, and her dress a white *chiton* or smock, with purple stripe on the right shoulder, and a red mantle thrown over the left shoulder. Summer season is also represented on the Museum pavements in two examples, the first (No. 10), from Halicarnassus, is a female bust with long flowing tresses crowned with ears of corn; the other, from Carthage (No. 43), a female bust wreathed about the head with ears of wheat, and wearing hooped earrings, a golden-coloured torque, a white *chiton* with yellow stripes on the right, and a red mantle over the left shoulder. The month of March is depicted in a Carthaginian tessellation of more than ordinary interest, for it illustrates a well-known pavement at Cirencester, which is adorned with a corresponding subject. This fine pavement in the British Museum (No. 41) exceeds in measurement 6 ft. by 7 ft. Here March is personified as a female figure leaning against a square *cippus* or altar, on which she rests the right hand. She turns towards another *cippus* on the right on which are two cups, and beyond it, at the extreme right of the subject there is a tree in the foliage of which there is a swallow, towards which she is pointing with the forefinger of the left hand, thus indicating the approach of spring. In like manner, the pavement found in Dyer-street, Cirencester, in 1849, has a figure of Flora, on whose shoulder the swallow, "harbinger of spring," is vividly and faithfully displayed. In this Corinian Flora nothing could better symbolise spring than the ruby-gemmed flowers with which the head of the figure is adorned. They heighten the effect. They are composed of tesseliæ of a bright ruby-coloured glass, the only instance of the use of this material in the Cirencester pavements, but, as we shall show by-and-by, a not uncommon material for the richer sort of tessellations found in Continental examples. In this Museum pavement there are shown a bronze-coloured bucket, with a green branch across it, and containing a white liquid, either water or milk; the personage wears an under tunic, green-bordered at the wrists, a saffron-coloured garment with hanging sleeves, and a green mantle with a purple lining. At her side is a plant growing in a two-handled vase, yellow shaded into red, and on each side of the vase foliage of an arabesque kind. April's changeable month is given on No. 42, a female, with a voluptuous expression, playing the castagnets. She may, perchance, represent one of the Gaditanian damsels, famed of old, as now also, for their skill in dancing. On the right is a circular *cippus*, on which is a little statue, perhaps of Venus (for does not Love hallow the April of Life), with a leafy bower behind it. This is a charming piece of tesseral art, full of poetry and feeling. It measures 6 ft. 9 in. by 10 ft. 6 in. Then comes ripe, matronly July (No. 46), another female, picking a mulberry with a stylus, daintily, from a dish of that fruit (which ripens in July), placed on a *cippus* under a mulberry tree. Over her green *chiton*, reaching to the heels, is a salmon-coloured garment with hanging sleeves, green striped with black and red. Last of the series comes November, a female too, holding a *sistrum* or musical rattle in the right, a *situla* or bucket of libations in the left hand, her sleeved undergarment is green, over it a yellow and white dress, the hair ruddy with a flaxen yellow topknot. We may place at the end of this class No. 29, a youthful male mask, with long hair wreathed, in a medallion.

The second class, that of hunting scenes and animal representations, is not quite so numerously represented in the British Museum collections. In Nos. 11, 12, two fragments of the same illustrative design,—an ibex, of bluish-grey, speeding to the right, is pursued by a hound of similar colour, with a red collar; another dark red hound, flecked with black, rushing forward, heads the quarry. No. 47, a rudely-made mosaic from Carthage, of the size of nearly 4 ft. by 9 ft., has for its design a mounted huntsman at full speed to the right, cheering on his dark blue dog towards a lost game; at the right an orange tree, laden with fruit; behind are tall plants and the broken lines of the rugged countryside. The dress of the hunter is a red jerkin with a black and white side stripe, and black boots; the horse is of a drab colour. From Utica another hunting scene is derived (No. 65), measuring 5 ft. by 11 ft. Within a fence of network are gathered a wild boar, a stag, a roe, fox, and panther, an ostrich, and two other birds, all in their proper colours; at each end of the net is a boat manned by two hunters, naked, except that one has a cloth around his loins. The scene is evidently laid near the shore of a lake or river, the ground is white, besprinkled with a few green sprigs; in the foreground are two lizards and a tree; near the boat, on the left, which, like the other one, has a sharp prow and stern, blue-black and red, with a yellow streak from end to end, are two fish. These water-hunters are hauling in the end of the net so as to narrow the space in which the quarry is enclosed. It is an animated and interesting glimpse into the sports of the past. On another pavement, not yet numbered, in this room, is portrayed a hare coursed by a greyhound; and one of the Withington pavements in the Gallery of Roman portraits shows part of a boar-hunt arranged in a circle, with an outer border of birds. The animal forms which naturally fall into this second group consist (some in addition to those already described) of the lion, leopard, panther, horse, stag, bull, goat, dog, and deer. On four the lion occurs; in two of them the monarch of the beasts is rushing to his prey,—a bull and goat,—at full speed to the right (Nos. 13, 14). In front of him in each case is a tree. The colours of these lions are yellow, red, blue, white, and black. Their form and design may be contrasted by the artistic student with those of the lion of the Orphic pavement at Cirencester, the one spell-bound under the musical numbers of the master's lyre, the other masterful, rampant, and full of life, in quest of his prey. Almost the same colours are employed in each case, but differently arranged. The leopard and lion in the scene of Meleager and Atalanta have been already pointed out; so, too, the panther of Dionysus. The horse is seen in No. 1, where a wounded horseman is lying on a track by the side of his charger, perhaps a part of a pavement representing the games of the circus. This came from the Pourtales collection. Another fine Carthaginian pavement, not yet numbered, in the inner room, shows a horseman successfully lassoing a stag, at full speed, to the right. The stag is seen, not only on this pavement, but on one of the tesselated pavements found at Withington, and now on the wall of the gallery. A stag and deer drinking by a fountain may be seen on No. 47, from Carthage. The Jovian bull of Europa we have already noticed. Dogs are not uncommon, in many attitudes, and of various hues. The goat occurs in No. 48, where two are springing forward to the right; one is pierced in the side, the blood falling to the ground. They are fawn-coloured, shading into grey, with black outlines. It is a late and coarsely-made pavement from Carthage.

Bird pictures form the third class of our division. On nearly twenty of the British Museum pavements they occur as subordinate accessories. They are mostly of the domesticated kind, if we except the ostrich which is found in the drawnet scene; the eagle, a favourite military symbol, strange to say, does

not appear to occur. The medallions of the Halicarnassian villa comprise a duck, cocks, and other birds on branches (Nos. 23-26, 28); a bluish-grey bird, with wings, crest, and legs red, holding a twig in the beak (No. 31). A francolin is given in No. 48, the scene of the wounded goat, speckled blue, yellow, and red. A peacock, guinea fowl, and other birds occur in No. 67; the brightly-coloured tesseræ, probably glass, of many of these birds seems to have been in ancient times purposely picked out of the pavement. It is from Utica, and some part of its design may be compared with the gorgeous peacocks of the Cirencester pavement. There is a drinking peacock in a fountain scene (No. 49). Ducks and pigeons occur on some pavements not yet numbered in the lower room; and some birds are found on two British pavements in the Bust Gallery. Our next class comprises fish and fishing scenes.

Perhaps these subjects adorned baths and bathing-rooms. The fish are not only subordinate to more pretentious scenes where they are used to indicate locality, but frequently occur alone as the principal element of the composition. Just as we have already pointed out, in our recent notice of the archaic Greek vases in the Museum, objects of marine origin entered largely into the ornamentation of the early pottery of a people so pre-eminently maritime in their proclivities as the Greeks, so here also, in pavements which, as a rule, must be attributed to a late period of classical art, the dolphin in Nos. 5, 15, 16, 46, 53, and others, as well as in one of the Withington pavements; the long-mouted wrass and the sword-fish (No. 4); the *dentex* and the *sparus* (No. 27); a deep-bodied thick fish (No. 33); a red and yellow perch and black and purple lobsters (No. 51); the *muræna*, prawns, tunny, wrass, eel, sea-perch, and lobster, fallen from a fish-basket, all in natural colours finely shaded (No. 52); the red and the grey mullet, dolphin, *dentex*, and wrass (No. 66), and several others present themselves to the visitor as he makes the circuit of the room. Water-scenes and fishermen belong to this class. Boats occur in two pavements from Utica; both examples are of pointed beaks, one has the curving neck and head of a swan for a figure-head (No. 66); over the gunwale hangs a line or the edge of a net. One of the fishermen is raising out of the water a fish which he has hooked. The last class into which we have divided the subjects of the tesselated pavements, that of geometrical and ornamental devices, may be illustrated from almost every existing specimen. These patterns are, in several instances, not subordinated as borders, but they form the whole ground of the design. Many of them, from the strong contrasts of their colour, and others for their subtly-blended shades, stand out as marvels of the application of simple rules of geometry and of rudimentary designs to highly artistic ends. Hence the guilloche twists, cabled borders, threefold and fourfold plaits, meanders, rosettes, ivy-leaves, quatrefoils, crosslets, and other simple devices, cunningly retained by the true feeling of the artist from the oldest periods, please and gratify the eye that has already feasted upon far more complicated patterns, beyond expression, from their pure simplicity and chasteness, and we must go back 2,000 years to find the origin of patterns which, even to-day, form the stock-in-trade of the designer and colourist. The guilloche pattern is seen to good effect in three pieces of pavement from Abbots Ann, Hampshire, presented to the trustees of the British Museum by the Hon. and Rev. S. Best, in 1854; the spiral, with radiating leaves, in the little bit of the Woodchester pavement, in the same gallery; the plaited border, enclosing a circle in which is a floreated cross, on the right hand of the gallery, in a pavement found on the site of the Bank of England, and presented by the governor and directors of that institution; and an elegant picture of alternate squares and lozenge, enclosing fourfold knots, rosettes, meanders, and quatrefoils, is preserved on a pavement found in Threadneedle-street, in the City of London, and presented by Mr. E. Moxhay to the authorities of the Museum in 1841. The chequer-pattern, representing rows of parallelopipeds seen in perspective, coloured white, black, yellow, red, and green, is shown in two pavements bequeathed by Sir William Temple (Nos. 2 and 3); squares and lozenges, enclosing a quatrefoil, in No. 37; cubes in diagonal rows, with an embattled border, in No. 59; the lozenge, guilloche, and *pelta*, or Amazonian shield, a very archaic ornament, in No. 5; the guilloche and black-and-white wave pattern in No. 8; guilloche and checky border in No. 45; intersecting circles, green and red, embracing crosses and quatrefoils, in No. 54; ivy-leaves in No. 57; and star and flower patterns in No. 60. Of this class, a fine pavement at Leicester has nine octagonal compartments, enclosing quadrilateral and triangular figures interlaced by a rich guilloche of various colours. It was discovered in 1830, and originally about 24 ft. square. Inscriptions and explanatory words or names occur on several pavements in the Museum collection, but we must leave them to say a few concluding words upon the fabric of the pavements and their component parts.

Many of them rest on a concrete floor carefully prepared upon the natural earth, which was probably beaten hard first of all; others, however, especially when in connexion with hypocausts, rest upon short pillars made of loose courses of tiles or bricks about 1¼ in. thick. Each pillar has a larger tile for a base or plinth, and another of the same size by way of a capital. They stand in rows at irregular distances, some about 1 ft. 6 in., others as much as 2 ft. apart. These capitals are then covered with brick tiles of 2 ft. square, forming a flagged surface, upon which the concrete backing of the pavement itself rests. The antiquary Lysons, who took great interest in these remains, states that the foundation of a pavement which he published in the "Reliquiæ," consisted of rammed gravel, covered to a depth of 6 in. with a concrete composed of gravel, lime, sand, broken tiles, and rubbish. This was covered in turn with 4½ in. of a mixture of pounded brick, lime, and sand, over which were laid the tesellæ about ½ in. in depth. The materials of the tesseræ themselves have frequently formed the subject of special inquiry. No doubt great care was exercised in choosing choice specimens of coloured stone, marble, and other hard materials from the vicinity of the place where the work was executed. Sometimes, however, materials have been employed which, though excellent in respect of tint, are of so soft and friable a nature that they are not suitable in any other respect. This selection was, perhaps, guided by the effects observed by the designer in a previously drawn and coloured working plan. In shape the pieces vary from about 1½ in. diameter to a mere chip, and it is this variation in form and size, as well as in contour when the design needed curves, that the work was rendered so free in outline as we frequently see in old pavements; modern imitations are too regular in size, as though the cubes were machine-made. The prepared tesellæ were united to the terrass, or bed, by a firmly-setting cement, of fine lime, so strong in its adhesive qualities that a slab of dry work would fracture as readily through the cubes as at the joined edges. Finally, the surface was polished, and the varying lustres of the various materials contrasted together to heighten the effect of the whole. Of natural colours Buckman found the white to be a chalk; cream colour, a freestone from great oolite; grey, the same after roasting; yellow, oolite and pebbles; chocolate red, old red sandstone; slate and black, from the limestone bands of the lower lias. The artificial colours were light and dark red, and black, from terra-cottas, susceptible of little or no polish; and a transparent ruby colour, of glass, the occurrence of which material in British mosaic pavements is exceedingly rare, although in Continental mosaic by no means uncommon. He concluded that glass was sparingly used in British pavements because only one figure, that of the fine Cirencester Flora, contains it, out of the great number of pavements already excavated. Voelcker's analysis of this glass gives oxide of lead, *protoxide of copper* (in considerable bulk, to give the colour), alumina, oxide of iron, silica, and potash. The use of gold for the ruby colour is believed to have been unknown before the seventeenth century. In one of the British Museum pavements, that of the wounded goat (No. 48), there is a bird on a branch, called a francolin, of which the somewhat small tesellæ are in many instances of glass, of a deep lapis lazuli colour; other birds (No. 67) have glass cubes of turquoise blue; and the fine head of a marine deity (No. 68) has yellow glass or topaz-coloured cubes in the beard, perhaps other gems or glasses as well, which produce a striking effect when awakened into life by a beam of light. Interesting as these pavements are, as monuments of the past, they have, says Mr. Westmacott, a further claim on our attention for the qualities of art which they exhibit, and in this respect they claim a superior place among antiquities. The execution is somewhat coarse sometimes, but this is owing to the nature of the materials and the mode of workmanship. The details and drawing may be rude, but apart from these mechanical and technical defects, there is a style in them which elevates them to the best period of art. Another point of comparative excellence is the quality, breadth, and distribution of their colour; there is a picturesque grandeur about them, a strong love of nature, and a thorough acquaintance on the part of the designer with the full extent of their applicability. Hence their success and esteem in old times, their appreciation and importance as teachers of true art in our modern collections.

SEPULCHRAL AND MEMORIAL ARCHITECTURE.

No one will deny the interest, historically speaking, of the subject of the architectural treatment of sepulchres and memorials of the dead. The desire for such memorials has been developed so early in the civilisation of every nation that the style and character of tombs among each nation have really been, in some cases, among the chief factors of the future architectural style of the same people, and even of others who have succeeded them and developed their ideas. The most remarkable instance of this is to be found in the fact that some of the forms of classic architecture, indeed the most important parts of them, which have been multiplied and repeated *ad infinitum*, and have influenced more or less the architecture of the whole civilised world down to the present day, are drawn from the architecture of rock-cut tombs in Asia Minor, which were themselves drawn from a wooden architecture (probably domestic) that has perished, but as they stand are, nevertheless, the origin of a great portion of the details of the Classic "order." But there is another interest in the subject for the architectural artist, besides the historical one. For the sepulchral monument or memorial, when it approaches to at all a large and elaborate scale, affords an opportunity, seldom afforded now, for architectural design absolutely free from the trammels of practical requirements, for the indulgence of fancy in the attempt to make a thing of architectural beauty of detail and proportion and expression, free from any consideration as to position of windows, or doors, as to general plan or ventilation. The architect who has to design a monument is for once and for the moment free from the prosaic side of his art, and at liberty to play with it as he pleases.

We have used the terms "sepulchral" and "memorial" architecture as having a separate meaning. The class of work we are considering may, in fact, be divided into three heads. The tomb or sepulchre may, in its simplest form, be regarded only as a place of safety for the body, to which so much reverence has often been attached; a stronghold securing it against theft or spoliation by man or beast. The next stage is the decorative treatment of this citadel, so as to make it at once an opportunity of showing honour to the deceased and a memorial of him to the eyes of succeeding generations. Then comes the third stage, when the memorial is entirely separate from the sepulchre, and is a monument pure and simple, an erection to recal the dead to mind and record his achievements, placed in some site where it may be conspicuous, but which might have been inconvenient or unsuitable as an actual place of interment. In this case the sepulchral idea may be abandoned; the monument, that is, may cease to give any idea, in its design and construction, of being the receptacle of the dead, and may take any form and character which, to the designer, appears most suitable and expressive. When the memorial is not separate from the tomb, then the sepulchral idea should always be at least hinted at, so as to preserve the true expression of the actual meaning and function of the erection.

There can be little doubt that the earliest form of sepulchral monument was the mound heaped over the site of the tomb, to mark the place from a distance. This is the most natural and simple manner of making such a monument; and when this form of monument passed first into what could be called an archi-

tectural stage, its shape and construction seem to have been determined in the first instance by structural considerations. For this is the probable origin of the upright base of masonry which is so constant an accompaniment of the mound form of tomb, and which retains its importance even after the tomb has ceased to be actually a mound, and is a built-up pyramid of masonry construction. Originally this masonic base to an earthen mound served both to define the limits of the monument, to preserve it against distortion from the slipping down of any of the material, and to allow of entrances being conveniently made to the interior. This form of pyramid upon a drum or base of masonry is due, as far back as our knowledge takes us, to the Etruscans, who have at any rate left the earliest known examples of it. The same form occurs as a favourite one not only among the Romans, who were the natural heirs to Etruscan ideas, but in the topes of India, for the latter exhibit the same form in its essential features; the drum with the mound rising above it is there, only with the difference that the mound is domical in form instead of pyramidal. In the Roman tombs derived from this Etruscan form the upper portion takes the shape of a series of steps, and the drum portion becomes in many cases the opportunity for the application of a cornice and an order of pilasters or columns exhibiting very refined qualities of architectural detail. The stepped pyramid above is a method of finishing the structure not by any means worthy of the ground story in these cases, or in keeping with it; and a much more effective and more artistic treatment of tombs on this principle might be devised, having the same general outline, but differing in detail, were there ever any occasion for tomb buildings on such a scale in this utilitarian and matter-of-fact age.

The Egyptian pyramidal form belongs to a different category from this Roman and Etruscan tomb. It is square, not circular, and it wants the raised architectural base, and rises straight out of the ground; but in all probability it may be classed apart for another reason, that its main intention is not so much monumental as preservative, and it is, in fact, more distinctly a tomb and less of a monument than the Etruscan form. For with the ancient Egyptian the preservation of the body until a far-off day of resurrection was all-important, and the pyramidal tombs of the monarchs, who alone probably could afford this best chance of preservation, seem to have been intended to be as far as possible indestructible and impenetrable, mainly with this object. To us the architectural interest of these tombs is of a somewhat commonplace order in reality, being merely that of huge mass and stability without expression, excepting that of durability, however impressive they may appear through the influence of association with the distant past. But we find in the works of the later dynasties of Egyptian kings examples of monuments and tombs of quite a different order. These may be divided into two classes, tombs with architectural façades, but which are *bond fide* tombs intended for the preservation of the body, and obelisks, which come under the third head of monumental objects not immediately connected with the place of burial. The Egyptian rock-cut tombs seem to have practically just the same object as the Pyramids,—that of preserving the body in security from decay and destruction. The builders of the Pyramids erected a mountain of masonry with a sepulchre in it for this purpose; the later Egyptian kings cut their sepulchres out of the natural rock, and provided them with an architectural façade. How wide spread has been this method of architecturally treating the sepulchre it is needless to remark, nor how important in architectural history are some of the lessons to be read from these architectural sepulchre frontals, of which the Lycian set have, as observed, played so remarkable a part. But it is worth while to suggest whether there is not a beauty and a fitness about this treatment of monumental architecture, where the ground admits of it, which might very well be made more use of than it is in modern times. The modern "vault" is usually sunk vertically into the ground, and a monumental erection built over it, or over part of it. In the Lycian rock-cut tomb, and others of the same type,—the tomb is excavated horizontally in the earth or rock, and a façade hewn or built before it. This was a type of tomb peculiarly suitable in days when it was usual to consume a body, and when nothing remained to be preserved of the dead save, as Tennyson puts it,—

"Two handfuls of white dust, shut in an urn of brass."

Then the urns which held all that remained of the departed could be ranged on shelves or in niches in the sepulchre, and the chamber became a sacred home of the dead to which the door in the centre of the façade gave entrance, so that the façade now had really an architectural signification. This was the case also in some tombs of the Etruscan type, and in some Roman family vaults, where niches for urns were provided, not only for members of the family by blood, but for the class of servants and "freedmen," as parts of the family, considered in its widest social sense. Among the ancient Scandinavians, in pre-historic periods, there are traces of the same arrangement; there would appear to have been two distinct classes of monuments, strongly analogous to the Egyptian rock-cut tombs and obelisks respectively, viz., "gallery graves," in which the remains of families or tribes were placed in due order and grouping, and "dolmens" which were apparently monuments of special individuals of importance.* This form of sepulchral architecture seems to have a special practical interest for us in the event of the possible more general adoption of cremation; we say "possible," for we incline to think there is a considerable feeling of opposition to this method, partly from sentimental and partly from practical reasons, which will take considerable time to surmount, though we are disposed to believe it will be surmounted by degrees. But if this system were more largely adapted, the tomb cut in the side of a hill or of rising ground, with its niches for urns or for regularly designed memorials of those whom it was desired to commemorate, and its architectural setting visible from a distance and giving access to the room around which these memorials were placed, would certainly be a form of monumental sepulture eminently suited for the supposed conditions, and would give many interesting opportunities for new and picturesque variations upon an old architectural idea, and a very beautiful and suggestive one.

The Egyptian obelisk is perhaps one of the best simple ideas that have ever been suggested in the way of marking from a distance a tomb or the neighbourhood of a tomb, the occupant of which it is desired to keep in remembrance. The idea which gives rise to this use of a lofty object as a monument is one which is almost, as it would seem, inherent in human nature. It is a pleasing and a soothing idea to the man who dies, perhaps with great purposes unfulfilled, that at least the query as to who he was and what he aimed at doing, shall be suggested to thousands of passers by for many generations by some landmark which shall not fail to excite attention and arouse question, as in Matthew Arnold's poem of the young hero who died slain in fight by his unknown father,—

"And plant a far-seen pillar over all,
That so the passing horseman may exclaim,—
'Sohrab, the mighty Rustum's son, lies there,
Whom his great father did in ignorance kill';
And I be not forgotten in my grave."

This is the real philosophy. also, of the use of the column as a monument, a use which, in this manner, is not so absurd as it sometimes seems in the way in which it is misused in modern days, when a statue is skied at the top of a column, where no one can possibly see it. But, apart from the statue, the column suppplies what is wanted, viz., some kind of tall object, not without form and comeliness, which may be seen from a distance, and may prompt the memory of him to whose honour it is erected. The column is not the best form to use, since it suggests the idea of supporting weight above its capital; but, without the customary statue, it is a partially excusable convention. But the Egyptians may claim the merit of having found the exact form proper for the purpose. The obelisk fulfils the purpose of calling attention from a distance; it is graceful in outline, and suggests no idea of supporting anything which is not there, or of being a portion of any form of architectural design torn away from its surroundings as the memorial column does; it is an object complete in itself, and exactly answering the purpose for which it was intended. It is true that the obelisk has suffered an evil fame, as being phallic, and therefore repugnant to our modern ideas; and no one who has looked through some of the Egyptian painted subjects which are either published or of which drawings are to be found in the British Museum can doubt that it was at least regarded in this light by some Egyptians. But the transition from pyramid to obelisk seems so natural and easy, the other derivation so much the reverse, that we imagine that it is still a question whether this coarser meaning was not merely tacked on to the object by vivacious imaginations, and whether, in fact, the obelisk does not represent merely the best form of "note of admiration," as one may call it, which can be put up to call attention either to the building before which it stands or to the memory of a deceased person. As such, at any rate, it has been extensively revived and used in modern times, and as such we think it may very well be used still; but it may be capable of modifications, especially as, in many cases, the same severe material, granite, originally used all but universally for this form of monument, may not be available, for economic or other reasons.

The form of tomb which has been connected for ever, perhaps, with the name of Mausolus (whose widow probably hardly imagined how successful her great monument would turn out to be in perpetuating his name), probably arose out of the mound form, or rather it is a kind of combination of that with the suggestions of the rock-cut architectural form of tomb. Just as the circular Etruscan mound developed, with the Romans, into the circular-stepped pyramid, so the square mound or pyramid became with the later Greeks the square-stepped pyramid crowned with some kind of figure, and rising from an architecturally-treated basement of more or less height. We can imagine that before built-up tombs were made at all, the idea of crowning a sepulchral mound with a figure to give it meaning and expression would very naturally occur, and such monuments as that at Cnidos, of which the lion now in the British Museum was the crowning figure, were the architectural form into which the simple idea of a mound with a figure or symbol upon its apex developed itself. The Mausoleum was only the same thing on a very grand scale. The Romans adopted this idea from the Greeks, but they could seldom shake off entirely the influence of that preference for the circular form of tomb which had been established from time immemorial on the Italian peninsula. The mole of Hadrian, as remarkable a work as the Mausoleum, was in its original form a kind of repetition on a circular plan of what was done in the Mausoleum on a square plan. The tomb of Cecilia Metella, and others of the same general form of design, seem to represent a combination of the two elements, the square Greek or Asiatic base being used as a substructure for the Etruscan circular tomb, both giving it a greater aspect of security, and raising into a more suitably conspicuous position as a monument. The Romans, however, made many variations of their own, on a smaller scale, on the Mausoleum form; sometimes it was a small pilastered and pedimented temple raised on a plain rusticated base; sometimes the base or lower story was considerably larger and architecturally more important than the actual monument, and took the form of an arched structure not very dissimilar from the usual Roman form of triumphal arch, with a smaller square tomb built on the top of it: not a very well-conceived or suitable form either architecturally or monumentally; the upper structure seems to weight the arch too much, and to make the basement of a tomb or monument an open gateway is not in accordance with the true idea of such an erection. This is more suitable, in fact, to a monument only, having no connexion with a tomb, such as is properly called a cenotaph, a word meaning simply "an empty tomb," a tomb erected for ceremonial only.

The Greeks suggested the same form of monument as the obelisk, the mere memorial without even the appearance of a tomb, in a very pleasing form in the "stele," a word signifying literally an upright stone. This form of memorial was probably actually suggested by the obelisk; but whereas the obelisk is most effective in simple form, and on a grand scale, and in very severe material, the Greek stele gave the opportunity of treating the same kind of memorial in a lighter and more graceful and varied manner, and on a smaller scale. The stele is the connecting-link between the Egyptian obelisk and the Christian gravestone: in its early form it preserves the character of a square, upright, and rather tall stone, of the same nature as the obelisk; in its later form it

* See Nilsson's "Early Inhabitants of Scandinavia."

is shorter and not square in plan, and borrows from architecture the decorative feature of the pediment, at least in some cases. Thus we may say that our upright headstones in modern cemeteries are of Greek descent, while a considerable proportion of the horizontal grave-slabs are of Roman descent. For the Roman built tomb contained occasionally, instead of an urn or urns, the stone semblance of a heavy coffer, in which the remains, whether in-urned or not, were supposed to be placed; and this coffer form has frequently been repeated in modern graveyards, very unsuitably, since its only meaning is as a chest or receptacle to hold the body or its remains, and it is therefore absurd to place such a form over a grave in which the real remains are interred far below the surface. We will hereafter touch on some of the forms of monuments prevalent since the Christian era.

SOME CONSIDERATIONS CONNECTED WITH THE MODE OF BUILDING PRACTISED IN RUSSIA.

IN contemplating the structure of houses in any country but England, we may generally take the climate or average temperature as a clue to the *rationale* of the way of building. We are, however, much too magnanimous to allow the petty consideration of what is best adapted to our wants to influence us in the construction of our houses. In Russia the case is different, for there the signification of the word "winter" differs greatly from the idea which is attached to it in England, and the chief objects to be borne in mind in the construction of dwellings are, first, to keep out cold and, secondly, to keep in warmth.

A reference to the plan of an Esquimaux hut would give the simplest and roughest solution of this double problem. It is circular in plan, and the centre of the circle is occupied by the hearth, over which in the dome-like roof there is an aperture for the passage of the smoke. The centre of this one-roomed house, being occupied by the fire, shows us the natural position of the heating element in such an extreme case, while the thickness of the walls, covered during winter with a thick blanket of snow, points to the solution of the second part of our problem.

Although the Russian peasants do not live in Esquimaux huts, the principle of heating from the centre and keeping the heat in is as applicable in the case of the "Eezba" or cottage of the peasant as to the construction of the hut of the Esquimaux. The shape of the dwelling naturally differs in the two cases. The material for building offered to the Russian is wood; his house is formed of trees felled and laid one upon another to the required height, which involves right lines and right angles in the structure of the cottage in place of the circular wall of the hut.

In Russia there are immense forests of pine and fir; these offer at once a cheap and ready material for the construction of the hut and for the means of heating it. In the building of these simple dwellings we see, carried out with greater art and refinement, the same idea which we have alluded to in the hut of the Esquimaux. The thick trunks laid one upon another, and joined together at the end of each log by a notch cut half through the thickness, so as to receive another log with a similar notch placed at right angles to it, are so arranged as to form a square frame; on this another precisely similar is raised, until the whole attains the desired height, forming a sort of square box. In the corners of this box huge posts are driven in, which strengthen the whole edifice and help to support the roof. The side walls are carried up beyond the last layer in the form of an obtuse-angled triangle, with its base on the highest course of wood. In the centre of this wall and of that opposed to it on the other side, there is frequently a post fixed which tends to the support of the wall and of the roof. The latter is very often built on the ground and lifted on to the wooden walls after their completion. Generally, the triangular structures stopping the gable-end of the roof are filled in below, and the whole raised to its position on the walls, as before indicated. The roof is, of course, nothing but a framework of wood, on which thatch, boughs, or small pieces of board as shingles are laid, thatch being the favourite, and in the middle a square aperture is left for the passage of the chimney. The ingenious manner in which the logs are locked together by the notches above referred to, renders the structure firm, and the interstices between the logs being filled up with tow and hemp, somewhat as calking is done on board ship (minus the pitch), both from within and from without, a tolerably safe barrier against wind and snow is set up. This is often rendered more secure by planking over on the outside.

The next object is to provide for the heating element, and this is generally done by the erection of a stove of clay or bricks built in the middle of the floor, and reaching up to the roof, or in some cases but half the way, a rude chimney being constructed, passing through the centre of the roof. This stove is a cavernous oven, capable of consuming, in rapid combustion, a seriously large quantity of wood (generally birch). As soon as a certain degree of heat has been obtained, the aperture of the chimney is closed, to prevent loss of heat into the cold outer air. The embers, still glowing, but not smoking, impart their heat to the bricks forming the stove, which becomes uniformly hot all round, the mouth of the oven is then closed, and the room is heated to an extent and with an amount of regularity of temperature hardly conceivable to those who have not seen the machine in action. In such a hut one, or at most two, windows, of the most diminutive size, fastened by wooden shutters when unglazed, would be sufficient for the wants of the family, as far as lighting is concerned, while the ledges formed round the stove in its brickwork would offer the warmest and most convenient bedstead that a Russian peasant could desire. Such is, in effect, a Russian interior among the peasants. A shelf of wood going all round the four walls of the chamber affords at once couch, chair, bench, and wardrobe to the easily-satisfied Ivan; while a table of the roughest possible kind finishes the catalogue of the actual furniture. In this one room, on various sides of the stove, sleep the master, mistress, children, and daughters of the house, while the sons and other male workers repose on the shelf alluded to in the concise list of furniture above given.

A more aspiring peasant divides his hut in two portions by a wooden partition, or bulkhead, in one of which more favoured animals are permitted to stray in from the neighbouring "serai," or shed (or outhouse), to share in the warmth of their lords and masters, nor are they by any means rigorously excluded when the partition fails. A step higher in the social scale gives us another partition crossing the first, forming four rooms, all equally well warmed and sustained at a pretty even temperature, on account of the slow cooling down of the bricks of which the stove is made, and of the non-conducting property of the wooden walls and snow-decked roof. The less we say of ventilation in this primitive mansion the better; nor, when the family is numerous, the chimney a little defective, and the wealth in live stock considerable, is the odour altogether calculated to please the olfactories of the fastidious.

Rising in his pretensions with increasing wealth, Ivan aspires to a *corridor*, or, at least, to a sort of ante-room, which may receive a visitor before letting him into the heated room or rooms, and consequently letting out some of the beloved caloric, for which so many sacrifices have been made. The new comer shuts the outer door before opening the inner one, enters the chief apartments just described, off one of which this *entrée* has been cut. A further refinement carries this corridor through the house, and then two modes of construction become possible.

First, we may have this corridor carried along one side of the house, giving admission to two rooms, or it may pass through the centre of the house, giving admission, by doors to the right and to the left, to the four rooms, which then are heated by two stoves, the house being the double of that first described; such a construction, however, is less common.

But on account of the ease with which a house, built of such combustible material, is burnt, it has been thought fit to prohibit the building of wooden dwellings, within certain limits, in Moscow and St. Petersburg. Without those limits, however, in all the suburbs, in the country places around, and in all villages, houses are still built in the old way, with the old material.

The law is sometimes oddly evaded by building a house with a brick basement and a wooden superstructure, so that the lower floor with its "*kvartiers*" forms a brick house, and thus the police regulation is complied with, while it is evaded by the addition of timber rooms above.

As far as drainage is concerned, Russia has much to learn. Open cesspools are the order, or disorder, of the day. Some canals or sluices have been cut in some of the great thoroughfares; but when a thaw sets in, or a heavy fall of rain happens, they overflow, and the low-lying parts of the town are flooded. At the side of the pavement (?) next the road there is a wide gutter, down which the water rushes like a mill-stream until it reaches the apertures leading to one of these sluices, by which it is intended to carry it off to the river. Over these gutters, before the door of each house, there is a little wooden bridge, so that persons stepping from a carriage are not compelled to take a flying leap to gain the footpath. But when the flood is very high, these bridges are often overturned or carried away altogether.

The land belonging to the house extends to the middle of the road, and includes as much of the length of the way as corresponds to the façade of the house. Each householder *paves* (?) according to his own taste at as cheap a rate as he can. The result is a mosaic more striking than agreeable.

Along the sides of the larger and better streets many mansions, all differing in external appearance, rise imposingly; but however they may differ in outward show, the old theory of warming from the centre still holds good. Rooms are built in pairs, or in sets of four, warmed by the same stove, and leading one into another. We shall consider these structures in order, from the smallest house to the palace.

The smaller houses are nothing but reproductions of the four-roomed eezba (or hut) save that the walls are of brick, the windows large and *double*, the stove of very ingeniously contrived fire-bricks, so constructed as to form a system of pipes in the interior, through which the heated air is made to circulate. The surface of these stoves is white and highly glazed, so that the cleanliness of the appearance is extreme. Beyond these four rooms is yet a fifth, which acts as a kitchen, and here another kind of stove comes into play; this is something like the cavernous oven used by the peasant for heating and cooking; but, besides this, it is sometimes furnished with an apparatus consisting of an iron plate with circular apertures closed by a series of concentric rings. Below this plate a wood-fire is made, and pots of various sizes may be introduced by removing rings from the aperture in proportion to the size required.

A house of two stories is the same thing repeated on two floors, and is adapted to the accommodation of two families. But the general mode of building provides for four families, two "*kvartiere*" being on one side of the grand entrance and two on the other. In the towns *all* roofs are made of sheet-iron painted green.

There is, however, another system of construction, borrowed from Germany, greatly adopted in St. Petersburg (and beginning to be followed in Moscow) of enormous barrack-like houses, built of brick and constructed sometimes to accommodate families in various "*kvartiere*," and sometimes to accommodate individuals in a manner something between hotels and furnished lodgings. The walls of these houses are fabulously thick. There is one at St. Petersburg where the embrasures of the windows show a thickness of 3 ft. 8 in., all solid masonry of the best red bricks at 32 roubles a thousand! These great establishments are generally three stories high; those designed for the accommodation of families are divided into "*kvartiers*" of from four to eight rooms, each forming a self-contained commodious lodging. Those which are destined for the accommodation of single lodgers are built in immense flats, through each of which runs an enormous corridor, on each side of which doors lead to the various *lodgings*, which consist mostly of a sitting-room, bedroom, and ante-chamber. Sometimes such a house accommodates as many as 300 persons, and yet, from the thickness of the walls, one family is rarely disturbed by noises in other rooms. In such large lodging-houses the stoves are heated from the corridor, so that the lodger has no trouble about tending his fire. As in the hut of the peasant, the aperture for the escape of smoke is, at a certain state of the fire, stopped, so that no more heat shall escape into the cold air without. In the better class stoves there is a kind of valve in the pipe forming the chimney which, by being closed,

shuts off all connexion with the outer air and keeps in all the heat.

Beyond these, again, there are fine brick buildings of two stories high, built to accommodate the better class of *employés* in the Government service, bankers, merchants, and others whose means enable them to attempt style and display. Each story contains fourteen or more rooms, of which the front rooms are all connected by folding doors. The floors are all inlaid with oak; the smaller rooms are so arranged as to be heated by one stove for each two, while the grand *salons* are warmed by two stoves each.

But the general taste of the wealthy Russian leads him to affect a style of life incompatible with living in flats. In this case the construction of the house is very peculiar, the reception-rooms being all on one floor. The windows in this case are very high, and the rooms lofty, so that the frontage gives the idea of there being only one story in the building, but the back rooms are low to make room for a series of still lower bedrooms built above them. Everything is often sacrificed to display, and while the dining-room, ball-room, saloon, cabinet, drawing-rooms, and boudoir, are as magnificent as imagination can very well conceive, the upper apartments are low, poor, and mean.

A great point is always the reservation of a spacious room as an entrance, where overcoats, fur coats, goloshes, &c., must be deposited before the visitor is announced to the "barin." In this ante-chamber one or two lackeys generally sleep on benches, which contain their clothing, &c., like lockers on board ship. As a rule no special provision is made for servants unless there be out-houses, in which they manage as they best can. In most good houses the kitchen is built in a wing or side office, into which the mistress of the mansion never penetrates. The great number of these long buildings takes up much of the ground of Moscow, and the more so as they stand in courts (*dvorr*), which form an institution in Moscow.

The *dvorr* is either in the front or at the rear of the house. It contains several smaller houses, nowadays let out to tenants, which were in the old days the servants' quarters. Even now the kitchen is usually apart from the house in the court, to avoid the disagreeable odours which will issue from the best regulated kitchens. Most of these houses are still built of wood (beyond the prohibited radius), and coated over with stucco, so as to look very imposing. Of course, such a structure, involving so much waste of land would not be possible in a town where land was very valuable. The houses are called by the name of the owner, and a person living in a lodging for which he pays rent, is written to with the name of the actual proprietor (where we should give the number in the street), as part of his address.

The grand houses of the more important nobility are enormous palaces, and in these the corridor of the second class of house described before is replaced by a grand reception-hall, on each side of which large folding-doors lead away to the drawing-rooms, library, cabinets, dining-rooms, billiard-rooms, &c. From this grand hall the stoves are heated, the faces of which are turned to the rooms referred to. In the grander suites of apartments in imperial palaces (in the Kremlin, for example), room follows room in a seemingly endless vista, while the apartments for attendant nobles remind one oddly enough of the partitioned *kvartiere* of the lodging-house referred to on the previous page. Of course this does not apply to the high officers of state, such as the Lord Warden of the Kremlin, or the Commandant of Moscow. The Police Master, the Governor-General, and others have separate official palaces constructed in the manner above indicated.

The extreme cold renders a precaution necessary with regard to windows which is unknown to us. They are not only double, with a space of from 3 in. to 8 in. between the external and internal frames, but they are fastened up and secured with putty on the approach of winter, so that not a breath of air can ooze in through cracks and crannies. Communication with the outer air can be made by means of little trap-doors let into each frame in the corresponding panes, but these are rarely opened, and are not of necessity in every room.

The grandest of these imposing structures in the great towns of Russia are certainly the schools, and, whether for boys or girls, the *gymnasia* surpass all the other public or private edifices of Moscow, and are equal to most in St. Petersburg. In both towns the schools for foundlings are immense institutions, constructed on a plan reminding the spectator of such edifices as Greenwich Hospital, at least as far as size is concerned.

The desire of having an equal temperature throughout a dwelling would naturally point to building in flats, and the further consequence is the construction, in the great palaces of the Crown, of immense series of magnificent chambers leading one into another like the rooms in the galleries of the British Museum.

For domestic purposes the stove of an average Russian dwelling is the perfection of heating. No dust, no dirt, no smoke, no trouble of "keeping up," and above all an equal degree of warmth throughout.

Russian architecture is a study in itself, and would lead far beyond the limits of this article, but it may be observed that the mixture of a heavy low arch, sometimes Saxon, sometimes almost what we are accustomed to call Moorish, supported on short, thick, tub-like columns, with what we suppose must be regarded as Byzantine capitals, produces a strange effect. The arch is often double, but without the supporting centre column which we should be led to expect, and the tub-like, or skittle column, is found in the older churches, monasteries, and parts of the Kremlin. In one of the grand courts of the Kremlin the façade of the palace is broken by long slender columns between the tall narrow windows, the shafts of which are ornamented, not with fluting, but with elaborate foliage carved with extreme regularity and beauty.

But the most striking feature in Russian architecture is the church, the domes of which are either richly or gaudily painted blue, green, and red, and are invariably surmounted by the Greek Cross issuing from the Crescent. This symbol, by the way, is not emblematical of the triumph of the Cross over the Crescent, but of the birth of Christ from the Virgin, whose emblem is the moon. The form of a Russian church is always the same; the style of decoration differs with the means or taste of the parish or proprietor, but the form is always the same; and whether the dome be gilt, or simply coloured, the cross, crescent, and supporting chains are invariably gilt. In the case of the churches the system of heating from the centre is departed from, and stoves are introduced in the corners of the building. Monasteries are generally built of brick; they are surrounded by a wall with the peculiar Russian battlements, and, below these, machicolations. The curtain is flanked, at regular intervals, by massive towers with few and narrow apertures for bow shots, or the passage of light; they are invariably machicolated. There can be no doubt that the Russian dome is the best form for throwing off snow.

THE UNITED ARTS GALLERY.

THE promoters of this exhibition have called attention to it, as an exhibition of international character, and representing artists who are not well known in England; but we cannot come to any conclusion very different from that which we expressed in regard to the first exhibition last season, viz., that most of what is really good in it is by painters already well known here and represented in other exhibitions. There are a few exceptions in this respect in the present exhibition, it is true. The works by Mr. Welden Hawkins, a painter who seems to be by birth an Anglo-German and by artistic choice and residence a Frenchman, certainly possess a claim to an originality which gives them some importance, but it is an originality of very doubtful order, and if the position which we are told, Mr. Hawkins has gained in the *Salon* and among Parisian artists was gained by paintings such as these, this only shows that eminence in French art is more easily gained than it once was. Mr. Hawkins appears to be a member of the sect of the "Impressionists," and paints the tones or colours of objects with no attention to detail or texture. For a painter to make an impression in this way he must have a keen perception of tone, which Mr. Hawkins appears to possess; and there is remarkable effect of light in his largest picture, "Derniers Pas," as well as some character and pathos in the figure of the old woman with her back to the spectator, painted as it is with heavy blotches of colour without the slightest attempt at giving the texture or detail of the costume. What painting on this principle may come to is shown in the same artist's smaller work, "The Flowers that soothe a Grief unhealed" (127), where, in the middle of a landscape, which all resolves itself into smeariness on close inspection (the tones are pleasant) is a figure whose face is a blotch of paint with no features, and whose ankles beneath her frock are apparently represented by two other indistinct blotches in such a position that, if these said blotches do represent the limbs, the figure could not maintain her balance for a moment, but must fall over on her right side. To put forth work of this kind as important painting is sheer affectation; there is a certain cleverness about it, but it is a kind of art which is thoroughly unconscientious. The large work by M. Bastien-Lepage, "Pauvre Fauvette," which is a sweet and pathetic figure of a little cow-keeping girl in a poorly-painted landscape, is a work not before exhibited, and is of some importance considering the position which its author has now attained; but we very much question whether this painter will ultimately take the position which his admirers are at present disposed to give him. He has talent enough for almost anything, but he seems to be a painter who is adopting in a self-conscious manner, and for the purpose of making a style, the simplicity and naïveté in the representation of peasant life to which Millet was led by a natural untutored impulse, and that here also we meet with that bane of so much recent art, affectation and the assumption of an artistic "pose," so to speak, which is the great sin of our "Grosvenor Gallery" contributors, with all their ability. Among works of less ambitious pretentions, Mr. Yeend King's "A Rent Question" (121), a landscape with figures, is the best work we have ever seen by that painter. Herr Von Molitor's "Defeated" (194), an interior with figures, is an admirable work in a fine broad style of painting, very badly represented by the scratchy sketch in the illustrated catalogue. "Arrival of the Fishing Boats at Dieppe" (225), by M. Gilbert, is a very good work of the "coast-scene" class, one or two other works by the same hand are equally good; the shipping and the figures are alike well drawn and interesting. M. Delobbe's "The Winnower" is another good work, a single figure of a peasant woman; and there is a fine example of Munthe's well-known snow-scenes. There are, however, but a few of this higher type among a large majority of paintings, of which many are commonplace, and some too bad and vulgar to be worth hanging anywhere, and the exhibition only seems to prove, as already observed, that we are familiar in England with the best Continental artists, and that the new names that are brought before us here have mostly nothing to give us nearly equal to what we have had from artists with whose names and reputations we have long been familiar.

The committee issue an illustrated catalogue, concerning which they quote a critical opinion to the effect that as regards printing, paper, and illustration, it is "quite exceptional." This, we feel bound to say, is not the case; it is nothing like equal either to the *Salon* catalogue or to that of the Royal Society of Water Colours; and we object very much to the foolish affectation (carried out also in some other "æsthetic" quarters) of making the book up with uncut leaves of various widths, thus increasing threefold the trouble of turning the pages and finding any particular number that may be wanted,—all this inconvenience being caused for the mere sake of following a fashion.

THE HAMILTON PALACE COLLECTION.

FAMOUS and important as are the collections that season after season pass through the familiar rooms of Messrs. Christie & Manson, in King-street, it is not often that a gathering of treasures such as that of the Duke of Hamilton has to be dispersed under the hammer. Sales there are and have been of choice possessions,—sales like the San Donato, the Soulages, and many others that might be mentioned,—but the scattering of a collection with so marked a character as that of Hamilton Palace can alone be compared to the famous Strawberry Hill sale of just forty years since, when day after day for hard on a month Mr. Robins, of Covent Garden, knocked down lot after lot of Horace Walpole's wonderful gathering of bric-à-brac. Time and taste have changed since then, when the very nomenclature of the objects was a mystery to

the catalogue compilers. Both in France and in England, within forty years, there has been an advance in knowledge,—only another form of taste. The equally wonderful collection of M. du Sommerard, which now forms the well-known Museum of the Cluny, was purchased by the French Government from its original owner, and thrown open to the public only a year after the Strawberry Hill sale. The result has since been described as "a sudden and complete revelation"; a few years later, in 1856, M. Sauvageot presented to the French nation the wonderful collection of objects he had so patiently gathered, and which now forms one of the glories of the Louvre. A year later our own South Kensington Museum was founded, since when every one interested in art has had it within his power to make himself familiarly acquainted with almost every branch of art that mankind has created; the most distant corners of the earth have been ransacked for antiquities, while the sale-rooms of Paris, London, Vienna, Berlin, Brussels, and New York have season after season poured into our houses myriads of objects that a new "taste,"—of late years intimately connected with the social aspirations of a large number of persons,—has, it would seem, positively created. By that accepted commercial axiom that, wherever there is a demand, a supply must be found, the collectors of curiosities have had their desires amply satisfied, during the early years, with genuine objects which have now long since become scarce, but have been skilfully replaced by clever imitation.

It is the peculiar interest attached to sales such as that of the Hamilton Palace collection that the objects composing them were all, except the pictures, gathered at a period when the imitative skill of the present day was not alone unknown, but unnecessary. In those happy days it was the few alone who appreciated the marvels of the patient past, and how can we sufficiently repay our debt of gratitude to such storekeepers without whom the revival of the lost traditions would be impossible, which now by the aid of the collections we possess and owe to their appreciative care, so sturdy an endeavour has been made to restore. The true taste of these collectors was shown in appreciating what they found those about them overlooking, uninfluenced by fashion, they saw and understood the merit of the work which now we have learnt to respect, and for which governments and choice collectors find no valuation too high.

The Hamilton Palace collection cannot, of course, be said exactly to consist of what is generally understood as bric-à-brac. The collection was not formed in any of the spirit in which such gatherings are usually made. It is, as every one now knows, the princely collection of many generations, and bears that stamp, imperfectly as the objects can be seen in Messrs. Christie's scarcely sufficiently ample rooms. The objects chiefly belong to the palatial period of decorative art,—to the *grand siècle*, and its scarcely less showy successor. It is no *bourgeois* art suited for the crowded and cramped dwellings which we now seem to delight to inhabit; it belongs to a period when all was grand, when the huddle of our modern receptions would have been sadly out of place with the grand air and fine costumes, when apartments were large enough, and were purposely so designed to enable the guests to picturesquely group themselves and freely move about. It was not a glorious period of art, we shall of course be told, however brilliant from a political and literary point of view, but the creations of the artists of the time bear, it cannot be denied, what is so sadly wanting in our work in the present day, a marked character of their own.

The collection of decorative objects which compose the Hamilton sale is, perhaps, as representative a gathering of work as it would be possible to see brought together. The first of the five portions into which the collection is divided, and composed of the Dutch and German pictures, and a number of choice pieces of furniture and decorative objects, was disposed of on Saturday, Monday, and Tuesday last. The interest connected with the pictures may be judged when it is remembered that many hold an historical position. The very large Rubens, "Daniel in the Lions' Den," which, from a letter written by the painter to Sir Dudley Carleton, we have full assurance, is entirely by Rubens's hand,—"*Tutto da mia mano*,"*—cannot be said quite to deserve the reputation it bears, and is singularly calculated to puzzle those who may be familiar with the magnificent "Lion Hunt," one of the superb Rubens' in the Munich Pinakothek,—a work also stated to be entirely by the master's hand, though Snyders's aid is sometimes suggested. The charming portrait of Rubens's first wife, Elizabeth Brant, is in the painter's happiest manner, while the copy of Velasquez's portrait of Philip IV. we can well understand, as we are told, the painter kept always by him as a model of thoughtful portraiture and solid execution.* A thorough Rubens subject, the "Loves of the Centaurs," and two *grisailles*, are worthy of mention,—one a design for a salver for Charles I.; the second, the portrait of the Duke d'Olivarez, the favourite minister of Philip IV.,—a work rendered familiar by the engraving of Pontius.

Several Van Dyck portraits further composed this first portion of the sale, but none of any extraordinary merit, among them the portraits of the Duchess of Richmond and her son. Several inevitable portraits of Charles I., and a charming sketch of Henrietta Maria, a superb Hobbema, a Van der Velde, two Steenwycks, of wonderful minuteness; Rembrandt, Brauwer, Teniers, and Ostade were also not ill represented. The Dürers were unquestionably disappointing, the portrait of the painter especially so to all familiar with the exquisite works at Munich and at Florence. The full-length panel portrait of Edward VI. by Holbein was certainly one of the most interesting pictures of the exhibition.

Whatever disappointment may have been felt respecting the Dutch pictures of the Hamilton collection (the chief treasures of which belong to the Italian schools), the extraordinary pieces of furniture amply compensated. They are such as do not every day come before the public,—relics, indeed, of regal magnificence, it is alone in palaces that treasures such as these are to be met with. Historical cabinets, the work of famous artists, such as André Boulle† and Riesener, adorned with gilt bronze chasings by Gouthière and Auguste, works in which are embodied all the splendours of Versailles and the delicacies of the eighteenth-century French court of the Du Barry and Marie Antoinette. The several specimens of Louis XIV. Boulle (or Buhl) work disposed of, were magnificent specimens of the cunning artist's work in ebony, brass, white metal, tortoiseshell, and ormolu, and offered a singular contrast in their low-toned richness of colour to the gaudy imitations which are so painfully familiar to the connoisseur as "Buhl" work. The so-called d'Artois cabinet, thought it has had some questionable additions made by its subsequent historical possessors, is a superb specimen of "Buhl" work only surpassed by the other pieces, such as the knee-hole writing-table and pedestal cabinet.

During the three days that the objects were on view, there was always a crowd round the interesting Louis Seize secrétaire, with its curious decoration of fan-paintings and lace; with its equally-decorated interior; it is precisely the secrétaire on which one would have pictured the frail Du Barry,—to whom it belonged,—delighting to indite her tender *billets-doux* to her royal lover. The secrétaire made for Marie Antoinette by Riesener, who has proudly signed his name, in ink, at the lower corner of the work, with the date 1790, and adorned in the centre with a richly chased subject by Gouthière is scarcely less interesting, and in reality far more beautiful than the Du Barry secrétaire. Poor lady, this present, with the accompanying *commode* or chest of drawers,—signed also by Riesener, 1791,—was among the last she was to receive; two years later, it will be remembered, the queen saw her husband carried to the guillotine. Delicate creations, the *ne plus ultra* of the cabinet-maker's art, the Duchess of Hamilton's drawing-room (from which these pieces of furniture came) will sadly miss such speaking relics of an unhappy court. The oblong writing-table, (which belongs to the same suite, and which was exhibited at the South Kensington Museum in 1862), inlaid with its trophy of flowers and companion medallions round the sides, is a positive marvel of skill. Delicate as are these works, they keep well their place beside the more grandiose creations of the earlier periods, the bronze gilt tables, with their huge tops of antique Egyptian porphyry and granite, on which group themselves so naturally the rare Oriental vases,—some among the largest in Europe,—and the ormolu clocks and *garnitures*. The Louis Seize clock by Kinable in its lyre-shaped case of Sèvres *gros-bleu* porcelain and ormolu, and pendulum adorned with fine old pastes, as also the Louis Quinze clock by Robin with its chased ormolu allegorical figures of Sculpture and Architecture, deservedly attracted during the show much attention. A whole suite of marquetry chairs, with the arms of the Hamilton family inlaid in the backs, two ebony Italian "Tudor" chairs, decorated in low relief, said to have belonged to Cardinal Wolsey, a quantity of the rarest Japanese gold lacquer-work, a large and superb oblong chest of black lacquer adorned interiorly and exteriorly with raised subjects in gold (once in the possession of Napoleon I.), the almost more than choice collection of Chinese enamels and agate and jade carvings, complete the wonderful gathering of objects which formed the first portion,—a fifth only of the whole collection,—of the Hamilton sale.*

* See Carpenter's Vandyck.

* The work is mentioned in the inventory of Rubens's effects, made on his death.

† This is the correct spelling of the name applied to work which, we know not how, is universally known in England, and printed so in the Hamilton's catalogue, as "Buhl."

* Rubens's "Daniel" realised the enormous sum of 5,145*l.*; the portrait of Elizabeth Brant, 1,837*l.*; Philip IV., 598*l.*; the "Loves of the Centaurs," 2,100*l.*; the two *grisailles* respectively, 1,680*l.* and 472*l.*; the portrait by Vandyck of the Duchess of Richmond, 2,042*l.*; that of the Princess of Phalsburg, 2,100*l.*; that of Henrietta Maria, 735*l.*; the Hobbema, 4,252*l.*; the Van der Velde, 1,345*l.*; the Brauwer, 609*l.*; the Ostade, 1,837*l.*; the Dürer portrait, 388*l.*; the Holbein portrait fetching only 756*l.* The furniture and porcelain reached also very high prices, the "Buhl" pedestal cabinet fetching 2,200*l.*; the D'Artois cabinet, 756*l.*; one pair of *gros-bleu* oviform vases reached 1,680*l.*

A TUNNEL UNDER THE ST. LAWRENCE.

UNDER the great stream of the St. Lawrence, near Montreal, it is intended to carry a tunnel connecting a line of railway on the north with one on the south side of the river. The length of this tunnel will be fully 15,000 ft. The deepest point of the tunnel gradient will be 170 ft. below the level of the river banks. The tunnel is to be completed within three years. The contractor, Mr. Roillard, of Montreal, has undertaken to execute the work for $3,905,000.

BRINGING THE SEA TO MANCHESTER.

THE proposal to render Manchester a seaport town is one of so bold and startling a nature, and the influence of the scheme, if carried into effect, on the manufacturing and commercial industry of the most densely peopled part of England will be so extraordinary, that a large number of our readers will probably be thankful for some further definite information as to the little known physical conditions of the case. The promoters of the undertaking appear to be thoroughly in earnest. They have published a small pamphlet, entitled "The Proposed Manchester Ship Canal, Facts and Figures in favour of a Tidal Navigation to Manchester," which is full of detailed and valuable information as to the commercial aspect of the undertaking. They have cited our own remarks on the subject of the displacement in various industries, which is now so rapidly taking place, in pursuit of spots attainable by water carriage; paying a tribute to the *Builder*, for which we have to express due acknowledgment, as "a journal well known for its clear and trenchant articles on questions affecting transit." And the facts which they cite are so numerous, so important, and so soundly based on statistical information, that it is hardly possible to condense them more compactly. Those of our readers who desire to know what is the actual state of the trade of Lancashire, Cheshire, Derbyshire, and Staffordshire should read the little pamphlet.

With regard, however, to the physical conditions of the case, the pamphlet is almost entirely silent. It mentions the fact that the level of the river Irwell, at a place called Throstle's Nest, is 61 ft. above the sea level, but does not state whether high water, low water, or mean tide level is referred to. The vertical range of the tides at the port of Liverpool, on the average of the springs, exclusive of the equinoctial tides, is 27 ft. 6 in.; the level of low-water being 8 ft. 8 in. below the *datum* level of the Old Dock sill. It will be of all the more service, to the scheme itself, if it be a sound one, and to those who may be disposed to support it, if otherwise, to inquire a little into the engineering features of the case, from the fact that the works which

have been so successfully carried out in the Clyde and in the Tyne are referred to as precedents for effecting a tidal navigation of the Irwell. The cases, however, are so dissimilar that only mischief can result from representing them as identical.

We may at once admit that as far as the industry of a great manufacturing centre, such as Manchester, is concerned, it is a matter not only of local, but of national, importance, that the cost of transport from the holds of merchant vessels to the factory, or to the warehouse, should be reduced to the lowest possible figure. The cost of transport from the sea to an inland town, whatever its amount, is a tax upon the industry of that town, which it is important to lighten as far as possible. The question, however, is a very grave one, in what manner that diminution of cost is most certainly to be effected; bearing in mind that in such a case as that before us it is not only the 709,000 inhabitants of Manchester and Salford whose interests we have to regard, but the 5,500,000 inhabitants within a radius of forty miles from that great industrial capital.

Next, it may be admitted, and indeed ought to be generally known, that although Manchester may justly claim the title of the cradle of the railway system, it has been served by its gigantic nurseling, much as the hospitable hedge-sparrow is said to be served by the ungrateful cuckoo that it has hatched and reared. The prosperity of Manchester is being devoured by the railways. One or two of the numerous facts brought in evidence before the Select Committee on Railway and Canal Charges leave no room for doubt on this score. There are eight distinct lines of communication between Manchester and Liverpool, viz., the public highway, two canals, and five railways. But the railways have combined, they have controlled the canals, and established a rate of charges so high that it is actually possible (incredible as it may seem) to send goods by road to and from Liverpool at 25 per cent. less cost than by railway! Any one who doubts the accuracy of this statement is referred to the evidence of Mr. Spence, of Manchester, before the Select Committee on Railway Rates, which will be found on page 473 of the Report (No. 226, 1881). In fact, the railways now charge 7s. 6d. for an amount of transport for which, twenty years ago, they charged 2s. 6d., and which could be performed by canal for 1s.

As an example of these charges we find in the appendix to the Report that from Runcorn to Chester, a distance of fourteen miles (226, i., 1881, p. 85), the London and North-Western Railway Company charge 8s. 4d. per ton "*ex* labour," for the carriage of round timber. This is equal to 2¼d. per foot, and, allowing for conversion, to more than 3d. per foot to the builder, measured in his work,—a very fair profit. Carried by canal, also "*ex* labour" of loading or unloading, for an equal distance, the cost would be less than 6d. per ton. It cannot be denied that Manchester comes before Parliament with a fair claim to be delivered from such intolerable oppression.

The question, however, of the best mode of doing this is not so simple. Water carriage to Manchester is now effected, or it would be more true to say not effected, by two routes. Of these the first is the Bridgewater Canal, which has been justly styled "the father of British inland navigation." The first Act of Parliament under powers of which this undertaking was commenced by Francis, duke of Bridgewater, is dated in 1759, the object being to supply Manchester with coal from the duke's collieries at Worsley. Under an amended Act, dated in 1760, the whole canal from Worsley to Manchester, with extensive subterranean works at the collieries, was executed. These underground canals and tunnels were eighteen miles long, and cost 168,000*l*. By powers given in subsequent Acts, the line was continued to Preston Brook, where it joins the Trent and Mersey Canal, and to Runcorn, where it falls 82 ft. into the Mersey, by ten locks. The total length of the Bridgewater Canal, between Runcorn and Manchester and Leigh, is 39 miles, 6 furlongs. There are fifteen locks, of an average fall of 7 ft. 4 in., each 84 ft. long, and 15 ft. wide. About 1,680,000 cubic feet was the maximum quantity of water taken in one day of twenty-four hours. The proprietors refused in 1870 to make any return to Parliament as to the traffic or receipts; but if all the water taken went as lockage it would allow for the passage of 180 boats per diem. The exact cost of the canal is unknown. There are heavy works on its line. In 1831 it is stated that it yielded an income of 260,000*l*. to the proprietor, the Marquis of Stafford.

The second waterway from Liverpool to Manchester is formed by the Mersey and Irwell Navigation; the first Act of Parliament for which was obtained in 1720, and amended in 1794. This Act authorised the "making the rivers Mersey and Irwell navigable from Manchester to Liverpool." It gave power to certain persons, described as undertakers, to scour and cleanse the rivers, to make cuts and branches, and to build locks, sluices, and weirs. In return they were entitled to demand a tonnage rate of 3s. 4d. per ton for all merchandise conveyed between Bank Quay and Hunt's Bank in Manchester. The length between the termini is stated as fifty-seven miles. In the Parliamentary return there are seventeen locks, 82 ft. long, 15 ft. 6 in. wide, with a fall of about 8 ft. 6 in. each. All the flow of the rivers is used for the purpose of navigation. The proprietors refused in 1870 to return to Parliament their tonnage or income.

"Commencing on the west side of the town of Manchester, at 93 ft. 3 in. above the level of the sea, the Irwell takes a very sinuous course to the west, passing Chat Moss, and uniting with the Mersey after having left Flixton House to the east." Near Warrington there is a navigable cut, called the Mersey and Irwell Canal, which shortens the course. The whole rise is 70 ft. It should be observed that this statement, which is taken from Mr. Priestley's "Historical Account of the Navigable Rivers and Canals of Great Britain," shows that the number and rise of locks above given, which are taken from the Parliamentary return, do not give a correct idea of the total rise surmounted by the navigation. Mr. Priestley's section shows a flight of ten locks at Runcorn, for the Bridgewater Canal, and then a level formed for twenty-seven miles to the junction with the Rochdale Canal at Manchester. The infall of the Irwell into the Mersey takes place at Carrington, at 40 ft. above Ordnance datum. The Irwell, which rises at the Erewell Spring, on the borders of Yorkshire, 1,325 ft. above the sea, is twenty-eight miles long, and drains 312 square miles, inhabited, in 1861, by 1,014,569 people. It skirts Manchester, which covers 4,294 acres, for a mile.

It is evident from these facts that the attempt to make the Mersey and the Irwell rivers navigable for sea-going vessels is one of no ordinary difficulty. The length, stated at fifty-seven miles in the Parliamentary return of 1870, is said by Mr. Priestley to be reduced to about fifty miles by cuts; but the total distance, if the river ran in an even course around the considerable *détour* to the south, would be only forty miles. Ten miles at least is thus lost in bends and twists, which, however unimportant for a barge of 80 ft. long, would prove formidable obstacles to a sea-going vessel of five or six times the length. The tides now ascend to Woolston, which is stated in the pamphlet to be only about fourteen miles and a half from Manchester as the crow flies. But it is just in the course of the Irwell above Warrington that the loss of ground due to the windings of the river mainly occurs; and for this distance, according to the data before us, the excavation to the bed of the canal will range from 62 ft. to 85 ft.; while the low-water tidal level attained by the excavation will be 93 ft. below the level of the Bridgewater Canal at Manchester. These are stubborn and very serious facts. The problem involved is to cut a ship canal, as regularly as can be done, to replace some thirty miles of winding river,—the section of the ground being as above indicated with reference to the water level. Such a cut, if effected, will be quite without precedent. The twelve miles of the improvement of the Tees, the fifteen miles of the improvement of the Tyne (as high as Blaydon), and the twenty-one miles of the improvement of the Clyde, while they have deepened the channels of those rivers so as to allow of the ascent of vessels drawing 20 ft. of water, have not affected the high-water level at Stockton, at Newcastle, or at Glasgow, by more than a few inches. To sink the water level at a given point by 61 ft., to dig a bed for a depth of 22 ft. below that level, and to keep the channel clear when formed, are matters as yet unattempted.

We trust that the enterprising merchants and manufacturers of Manchester will insist on having these engineering points made clear and plain before they finally commit themselves to so serious an undertaking. We feel the more bound to give this caution from the reference made in the pamphlet to the cases of the Tyne and of the Clyde, which, as well as that of the Tees, we have shown to be wholly irrelevant. Nor is the cutting of the canal the whole of the affair. Dock accommodation must be provided in order to render the canal of any use when made. The experience of Liverpool, as well as that of Glasgow, points to the rule of allowing from 50 acres to 66 acres of wet dock for every million tons of shipping. At Liverpool, where the tonnage of vessels in 1881 amounted 7,893,948 tons, the area of the wet docks open, or in course of construction in 1878, was 525 acres, with a lineal quayage of 33 miles, and Liverpool is at this moment crying out for want of dock space for its trade! In Glasgow, in 1881, it is stated in the pamphlet above cited, that there were 153 acres of harbour, for a total tonnage entered of 3,057,533 tons. The excavation of wet docks to a depth of 80 ft. and more beneath the surface, and the construction of roads and approaches, is a colossal task. Acre for acre it must cost much more to purchase land and excavate docks at Manchester, than it has done to reclaim dock area from the Mersey, or its shores, at Liverpool and Birkenhead. When to this we add the cost of raising the entire tonnage imported by as much as from 80 ft. to 100 ft. from the new quays to the streets of Manchester, it is clear that even bringing the tidal flow to Hunt's Bank would by no means free the traffic from serious cost.

How far the projectors of the canal feel themselves in a position to take possession of the channel of the Irwell, with or without the assent of the Navigation Company, we have no hint given by the promoters of the ship canal. A long experience of Parliamentary warfare does not lead us to judge that this will be altogether plain sailing. But when we weigh maturely the fact of the levels, when we look at the long level obtained by the Bridgewater Canal after ascending its great water ladder at Runcorn, when we look at the sinuous course of the Irwell, and measure its fall and its flow, we cannot help suggesting that it might be a safer as well as a more economical plan for Manchester to set her shoulders to the task of opening and improving, or, if necessary, duplicating, the existing route for a well-ordered canal navigation, than to attempt, at least in the first instance, the larger task. With the two canals free and open, we think transport would be effected from the sea to Manchester in as cheap a mode as can be desired. It may be said that the dock dues and town dues of Liverpool come to nearly 2s. 6d. per ton on shipping. True. But a Manchester dock, being more costly than a Liverpool dock, would ultimately prove heavier in its charges. It may be said, and said with truth, that it is one thing to ask, and another to obtain, and that the two canals, the owners of which refused to make returns of the traffic to Parliament in 1870, are under the control of managers with whom it is impracticable to make terms. But would it not be in the power of these people to make a much more effective opposition to a scheme for lowering the whole channel of the Irwell to so great a depth, than to any well-organised effort for compelling them to do what Parliament gave them powers in the trust that they would do?*

We take the warmest interest in any noble public work. We are convinced of the extraordinary value of the improvement of tidal rivers. The tonnage of the Clyde was 732,327 tons in 1831. It was 3,057,533 tons in 1881. The tonnage of the Tyne ports rose from 3,196,781 tons in 1861, to 5,968,886 tons in 1881. But the question, on which we do not pretend to form a judgment, but on which we wish to see a good deal more light thrown than at present is visible, is, will such a wide and deeply sunk cut form really the best and cheapest communication between the sea and Manchester? As at present advised, we doubt it. And even if it were so for Manchester herself,

* Since these lines were written, the publication of the draft reports of the Committee on Railway Rates shows that both the majority and the minority of that committee recommend that the Railway Commission shall be empowered to grant through rates on canals, notwithstanding any arrangements to the contrary, and to enforce the same, to the abolition of charges used in order to impede canal transport. If this be done, Manchester, by following our suggestion, will at once command the cheapest mode of transport from the sea (subject to further improvement), without having to enter on so serious a Parliamentary struggle as the project of a low-level canal would certainly originate.

how for the 5,500,000 of population within a radius of forty miles? Rather, it seems to us, if Liverpool be unreasonable, take advantage of the rising activity of Garston,—rather utilise some of the sandy estuary of the Mersey, which, between Oglet and Ellesmere Docks, is three miles wide. Rather follow Brindley's lead, and make a second Bridgewater Canal, with its long level pound, attained by a high flight of locks, and thus carry to Manchester, as you will carry further inland through and from Manchester, than attempt to turn an inland capital into a seaport, without much more distinct proof, not only of the feasibility, but of the economy, of such an enterprise, than as yet we have seen,—we will not say to be offered, but to be dreamed of as requisite.

Our one object is, that Manchester should have the cheapest and best mode of communication with the sea. It is as possible to ascertain what that would be, regarded as a scientific question, now, as after spending tens or hundreds of thousands of pounds in Parliamentary contests. What we urge, therefore, is simply this. Let Manchester take the best advice on this vital point.

THE OAK IN HISTORY, ART, AND HANDICRAFT.

THE oak in literature, art, and handicraft would form a delightfully instructive monograph. Indeed, confined to any one of these departments, the oak and its useful varieties and belongings would furnish ample materials for treatment poetically, artistically, and constructionally. We might begin with Moses and the prophets, or Homer, and not end with Evelyn and Sir Christopher Wren. Our purpose, however, is not merely to pile up heaps of acorns or stack sheaves of oak prunings and cuttings, but to illustrate our subject with some of the best examples and applications that the minds of the ages afford in relation to our theme. The oak symbolises, or has been made to symbolise, much by the common consent of mankind, and its literature, after 6,000 years, is a still welling and refreshing fount, not only of poetic inspiration but artistic suggestiveness. Fecundity, tenacity, durability are illustrated in its growth as a tree, and strength, with versatility of application to artistic and economical uses, as a plant and a timber. Throughout the books of the Old Testament there is frequent mention of the oak, both in respect to worship in groves of these trees, as well as in regard to some of the early uses of the oak as a symbolical plant or a convertible timber for economical ends and purposes. It would scarcely serve any practical aims to enumerate in detail these Scriptural allusions, but their indication as we pass on may suggest to other writers a useful subject for research,—students, for instance, in Biblical archæology. In these Scriptural allusions to the oak, it is, after all, difficult to conclude whether the words in many cases are used metaphorically or literally, or whether trees, or men of the qualities or characteristics of the oak, are to be understood. At the same time, the historic facts remain, that the oak was an important plant and timber from the earliest date, and has so continued through every change of society and manner to our own times. Not only in connexion with building, but with shipbuilding and other crafts, do the Biblical writers deal. The ships of Tarshish and the oars of the barks of Tyre are clearly spoken of; but, according to Ezekiel, the oars of the latter were made of the oaks of Bashan. Some of our translators have rendered it firs, but it is well known that the region of Bashan beyond the Jordan was celebrated for its great abundance of oak-trees. But we must not be tempted to note the frequent allusions to the oak and the incidents with the tree in Scripture from Genesis onward.

Coming to profane history, ancient writers mention four species of the oak in Macedonia; north of Greece the whole country was celebrated for its oaks, and those Chaonian acorns, of which special mention is made,—*Chaonii patres glandes*,—were the produce of Epirus, which was ornamented by the woods of Dodona. Pliny may be consulted for sundry interesting allusions to the oak. Civic wreaths or crowns were made of this plant, and students of classic history are aware of the estimation in which these wreaths were held. Before the harvest, husbandmen performed the rites of Ceres, crowned with oaken chaplets. In the Eleusinian mysteries, boughs of oak were carried, and wreaths of oak worn at the feasts were intended to commemorate the time when agriculture commenced. The oak was worshipped as a divinity out of respect to the original food of men. The Greeks were wont to swear by the oak, and betimes by the shade of it. A Greek proverb expressed age and experience when it spoke of such-and-such a man having eaten of the acorns of Jupiter. As to acorn food, Lucretius has it,—"*Glandiferas inter curabant corpora quercus.*" Boughs with acorns carried in marriage ceremonies were emblems of fecundity; and Hecate is described by Sophocles crowned with oak-leaves and serpents.

In accepting the Mosaic account of the creation literally, as regards man's entrance into the field of worldly life and labour, it seems remarkable how comparatively soon he was enabled to make a choice of materials for the most fitting ends and purposes. Choice in the region of practical wants naturally occurs through comparison and experience of what has been used before. This is particularly the case in connexion with the arts and handicrafts. Men use what their predecessors have used and found to answer. At a very early date in the age of the world, we find that the oak, the cedar, and some other timber-trees were selected for sundry artistic and handicraft uses. The selection of certain oft-mentioned woods need not be the result of any inspiration or even intuitive perception on the part of the early dwellers upon earth in Biblical times. If the chief personages whose patriarchal ages are recorded in Holy Writ lived the full term of years literally put down to them, it must be granted they had in most instances ample time, indeed, to know the building and other qualities of the oak and other woods; for many of the patriarchs must have long outlived the oak and the cedar. Apart in many matters, we find from the earliest time a good choice was made, and the industrial substances and materials chosen still obtain in one form or another after thousands of generations. In the early implements of husbandry and agriculture we find the wood of the oak was pressed into service. The handle of the primitive plough, as described by Hesiod, was made of common oak, and the share-beam of the evergreen oak. In the plough of Virgil, however, we have the handle of elm. In our modern British plough,—that is, before the introduction of the iron plough,—oak, ash, and elm, and, indeed, other woods, were used according to local circumstances and resources. The relative durability of the oak and larch is mentioned by Homer, and in modern times we find the Old Masters divided in opinion in respect to the most fitting wood for their art purposes. Both the Flemish and Italian schools painted upon tablets of wood. Raffaelle, it would appear, preferred the larch. We have examined some of those old painted-upon panellings, and, where large, they appear to have been well jointed (from a back view), and where not clamped or secured at the ends, had otherwise their widths tongued or dowelled together. We have also examined some very old large screens, the material painted upon being oak of darkcolour, the paintings in one or two instances being attributed to an Old Master. Here, too, the jointing appeared as good as could be wished, and in general characteristics the wood workmanship was like the former.

In quoting Vitruvius we may cite him in connexion with Evelyn, who advises the industrious in "Sylva" to consult the whole tenth chapter of the second book of the old architect in respect to the growth of the oak and the quality of the climate best suited to its cultivation. Very hot, or excessively cold, climates, according to our authority, are not conducive to the prosperity of the tree. Evelyn himself was of opinion that while the Venetians had excellent oak, neither that of Norway, Denmark, and other places mentioned were comparable to English, or, shall we say, British oak. Evelyn is enthusiastic in his allusion to the oak as well as to other native trees; and if it be desired to quote some well-known Classic authors at second hand, it may be done through the pages of the genial author of "Sylva." "To enumerate now," says this writer, "the incomparable uses of oak were needless; but so precious was the esteem of it, that of old there was an express law amongst the twelve tables concerning the very gathering of the acorns, though they should be fallen in another man's ground." The ancient shipwrights or barque-builders did not invariably build their vessels of oak, but often selected fir, beech, and alder. For piling and foundation purposes, and for uses under water, the oak was considered by ancient users and authors a most lasting timber. Theophrastus observes that the oak, buried under water, never decays, and that in rivers and lakes vessels are made of it; but he adds that in the sea it grows rotten. Strabo speaks of the ships of the ancients being built of oak; and Sophocles, in "Philoctetes," uses the term which may be translated as "oak-framed navy." We may have our doubts about some of the statements of Pliny in respect to natural history, but still he is entitled to be quoted as a Classic, if not always on the score of exact description. On the shores of the Cauchian Sea, according to this author, oak grew in the greatest exuberance,—"*Maxima aviditate nascendi.*" These oaks, we are told, undermined by the waves, and propelled by the winds, carried off vast islands in their interwoven roots. And he goes on to relate the terror of the Roman fleet in their encounter with these floating islands. Here are, indeed, suggestions for geologists and hunters after themes anent early colonisation from East to West. Elsewhere Pliny speaks of the enormous size of the oaks of the Hercynian forest. The description is, indeed, more than enthusiastic. These gigantic oaks, to use his own words, "unaffected by ages and co-eval with the world by a destiny almost immortal, exceeds all wonder. Omitting other circumstances which might not gain belief, it is well known that hills are raised up by the encounter of the jostling roots; or where the earth may not have followed, the arches, struggling with each other, are elevated to the very branches, are curved, as it were, into wide gateways, able to transmit whole troops of horse." These must have been grand primeval forest oaks, in sooth, fit abodes for the mystic Druids, and their weird worship.

In Cæsar and other authorities there are accounts of the extent and productions of this Hercynian forest. A modern naturalist, Ray, mentions an oak in Westphalia which served for a citadel. There is frequent mention of the oak, its associations and uses as a tree and a timber in British history from an early date. Shakspeare, who has scarcely left aught untouched, notices the peculiarities of the venerable oak still standing erect as monarch of the woods, though with crest leafless,—

"High top bald with dry antiquity."

Like the oak, in sooth, man shows the fulness of his years by withering atop. The great dramatist has immortalised the venerable tree of Windsor Forest (or perhaps a predecessor), known as "Herne's Oak." There are many historic British oaks, among them the Royal oak in which Charles II. concealed himself after the battle of Worcester; and, much farther back, the oak in the New Forest (or rather old forest), near which William Rufus was shot by Walter Tyrrel. The Cowthorpe oak, which stood near Westerley, is engraved in Hunter's "Evelyn." This was a gigantic tree. Within 3 ft. of the earth, it measured 16 yards in circumference, and close to the ground 26 yards; its height was about 80 ft., and its principal limb extended 16 yards from the bole. The Greendale Oak, of Welbeck-lane, was another large oak in its prime. There are two views of it in Hunter's "Evelyn." At 1 ft. high it measured 33 ft. 1 in.; at 2 ft., 28 ft. 5 in.; and at 6 ft., 25 ft. 7 in. The Boddington oak, mentioned by the same authority, greatly exceeded the two former in dimensions. The central oak of a number was the peculiar object of veneration in the British islands in early times as well as in Eastern nations. In the Isle of Anglesey, the ancient Mona, from time to time, have been dug up great trunks of oak, supposed by some historians to be the relics of the holy groves of the Druids. In the Irish bogs whole trunks of oak trees are often excavated, not singly but in numbers, and also the trunks of yew and fir. A chemical action through the constituents of the bog has in process of long years changed the colour of the oak to a deep black. The raising of this bog-timber, through turf or peat-cutting operations, has for a number of years past given rise to new industries, and the application of the timber to sundry ornamental and economical uses. Of the three general kinds of bog timber found,—fir, birch, and bog,—the former is so impregnated with resinous material, or the natural turpentine of the tree, that a splinter

of it burns like a candle, and is used by the turf-cutters and peasantry for such. Indeed, the chemical changes effected in the submerged wood would point to its evolution in distant time in the form of bituminous coal. Bog oak ornaments in the jewelry and fancy trades have obtained for many years, and, with gold and silver settings, these articles of personal adornment have had a fair sale, particularly in the sister kingdom and America. A great variety of ornamental household articles are made out of bog yew and bog oak. We will not stop to inquire whether the bogs of Ireland were primæval forests. Their conversion from swamp or forest dates from an unfixable period, far back in the misty region of space. The Druids of Pagan Ireland, or those at the time of the introduction of the Christian religion, lacked not oak groves or forests for seclusion, council, or worship. England, too, for long centuries was a thickly-wooded one, and oak forests were plentiful. Before the introduction of coal, or rather before its use, the woods and forests were to a great extent despoiled, and the timber cut down for fuel. Valuable oak, as well as other native timber, suffered the common lot. Even after the advent of coal raising, but before its general use, our oak and other forest timber was made use of for smelting purposes, cut down by wholesale in order to prepare the needed charcoal. In Ireland also in her early iron-making industry in the seventeenth century large districts of woods, oak and other trees, perished for smelting purposes, and when oak or other timber was no longer obtainable save at a great cost these native smelting works had to be given up. Mining energy and chemical science were both wanted for the utilisation of other native resources, but the time was not ripe.

In connexion with the history of British, and particularly of Mediæval, building, carpentry, joinery, carving, and furniture work, the oak, native and foreign, plays a conspicuous part. We need not dilate on its masterly and workmanlike use in our old ecclesiastical buildings. We see it in the design, the construction, and the execution of those marvellous open-timbered roofs, and in the deft, angelic, saintly, humanised, agonising, and grotesque carvings and expressive adjuncts that accompany them. As nature and human nature under the living tree communed, so the oak still, though felled and framed into a ribbed embodiment, spoke of a creation, power, and purpose, because embracing much of the genius and art and the living handiwork of a God-serving man. The germinating acorn might no longer quicken, no green foliage might be seen, but there was still a perennial fount of inspiration in the children of the craftsman's brain, and the faces, forms, flowers, and fruitage which his dexterous skill flung richly about or interweaved into a proportional and harmonised whole. In castle and mansion it was still the same. The oak of the adjacent forest or manorial plantations oft supplied the wants of the family mansion and the requisites of husbandry. The oak that contributed the roof and panelling of the dwelling was in part utilised for the needs of the farm. The acorns not only fed the swine, nor were the leaves collected merely for bedding-out manure, but were made to yield a dye, as the bark itself a tanning ingredient. Chemistry might be young in these old times, but thrift, sagacity, and common sense made up a compound of simple yet valuable domestic knowledge, which modern fashion has unfortunately nearly scattered to the winds. We lean upon a reed too often in many ways in these later days, instead of, like our predecessors, relying upon an oak, and, oak-like, tenaciously clinging to and embracing what should constitute our lasting support through life. The oak has given proverbs and maxims many to our language, as it has given subjects in all ages to painting, sculpture, and architecture. "The wooden (oaken) walls of England," carried proverbial "hearts of oak"; so in naval as in civil and ecclesiastical architecture, the oak, in symbolism and reality, is everlastingly incorporated.

In respect to wood sculpture, we have reliable evidence that the oak and sundry other hard woods were used by the ancients and many statues of deities and other worthies were sculptured or carved. Pausanias, Pliny, and other ancient authors may be consulted on the subject. In more modern days Felibien mentions a French artist at Florence, who executed sundry statues in wood. This wood-sculptor's name was Janni, and one of his statues, "St. Roque," was considered by Vasari as a marvellous production. This artist's creations in wood were said, in style and finish, to equal marble. Although the celebrated Grinling Gibbons is credited with having created a school of carvers in England, good wood-carving was executed in these islands long before the time of Gibbons. He certainly gave a great impulse to the art of wood-carving, and many specimens of his art in connexion with the churches and mansions of his great patron, Sir Christopher Wren, show remarkable grace and freedom, with appropriateness in the grouping and treatment of his subjects. It must not be forgotten that some of our old stone-carvers also occasionally manipulated in wood. The artists in marble, oolite, and other lime and free stones have in some instances operated on wood with much spirit and freedom, and no wonder need be expressed at their success, although a wood-cutting tool needs a different handling to that of the stone-cutting instrument. There are some specimens of the work of the wood-carvers of the Flemish school in Ireland as well as in England, and in the Royal Hospital, Kilmainham, Dublin, — a building credited to Wren,—examples in oak of the work of Grinling Gibbons are to be seen. Two classes of old wood-carvers obtained for long years in England,—the house and the ship carvers; but since the advent of iron shipbuilding the glory of the latter school has faded. The figure-heads, marine deities, ropings, mouldings, and other somewhat coarse but elaborate carvings in men-of-war and merchant vessels of Great Britain are no longer executed. Since the first decade of the present century there has been a rapid decline and contraction in ship-carving. Those who have an acquaintance with the monthly periodical literature of the last quarter of the eighteenth century need not be informed of the intense interest that was manifested in timber shipbuilding, its improvement, and the growth and quality of the oak of the British islands. A legion of essays, treatises, pamphlets, and letters flooded the market. In looking back through this buried mass of correspondence and naval architectural literature, few could ever conclude from the standpoint of the writers that half a century later would render the most of their suggestions and dogmatic statements of little avail. The naval victories of Nelson kept the national mind aroused, and acorn planting and sapling transplanting and the bending of young oaks in coppices into compact shapes for future shipbuilding went bravely on.

Some of the more special characteristics of the oak in regard to qualities and application, more particularly in relation to building, carpentry, and enduring handicraft, will form the subject of a concluding paper.

CORK CATHEDRAL.

DURING the last week of the past month another stage has been arrived at in the progress of the Cathedral Church of St. Fin Barre, Cork. By the addition of three stained glass windows in the north aisle of the nave, and one in the ambulatory, the entire of the beautiful series of coloured glass in both transepts, ambulatory, nave, aisles, and clearstory of the latter is now completed. There are no fewer than seventy-four windows in position, comprising 145 subjects or illustrations, chiefly relating to the Creation and the Fall of Man, his redemption, final judgment, and the glory of the future state in a temple "not made with hands." The last of those placed in the nave aisle are memorials to the late Lieut. Melville of the 24th Regiment, who was killed at Isandula, South Africa: the subject is the death of Abel by his brother Cain. In the ambulatory, the last and final window represents scenes from the apocalyptic vision of St. John. In the top compartment our Lord is represented in glory, having a two-edged sword proceeding out of his mouth; in his right hand are the seven stars, in the other the orb; in the bottom panel are the seven golden candlesticks, each differing in colour and design. In the centre panel are the Evangelistic symbols surrounding an open book, on which are the Greek letters A Ω,—Christ the Alpha and Omega,—the great subject and theme of the artist. It is a memorial to the gifted architect of the cathedral, Wm. Burges, A.R.A., and has been the gift of his father. Though not intended, there is a fitting suitability in the sentiment of these paintings. The cartoons were painted by Mr. H. W. Lonsdale, and they were all carried out by Messrs. Saunders & Co., with their successors in trade, Messrs. Worrall & Co., Endell-street, London.

COMPETITION FOR THE NEW HOUSE OF THE GERMAN IMPERIAL PARLIAMENT.

THE 10th inst. was the final term fixed for the sending in of the competitive drawings for the new Imperial Parliament House of Germany, and by twelve o'clock at noon on the date in question, being the last moment for the reception of designs in this competition, the committee found that no fewer than 196 competitors had handed in their papers in time. The very last of the rival drawings in fact only reached the Ministry of Public Works five minutes before the hour when the competition closed. The committee which has to adjudge the prizes, has had the whole of the drawings suitably hung, and is engaged now in examining them. The decision of the committee will be taken, and the premiums awarded before the public are admitted to view the collection. The Berlin papers state that there are some very remarkable designs among the number, and that the style adopted by the great majority of the draughtsmen is the Renaissance.

A large number of architects from all parts of Germany, as well as from the German speaking parts of Austria and Switzerland, are expected at Berlin when the committee announce their decision and admit the public to view the collection of competitive works. The flourishing Society of Architects of Berlin contemplate giving the visitors a festive reception in their splendid club-house, which has recently been re-decorated by Herr Prell, the artist.

THE FALLING MOUNTAIN AT ELM.

THE news of another catastrophe at Elm, in Switzerland, appears in the Continental papers of the past week. Fortunately, the new accident was not accompanied by the disasters which befel the village in question, on the occasion of the fall of part of the mountain last autumn. On the 12th of September last, it will be remembered that most of the village of Elm was destroyed by a mountain slip, such as had never occurred in Switzerland since the fall of the Rossberg, near Goldau, in 1806. At Elm there were eighty buildings completely destroyed, and 114 lives lost. Herr Heim, who examined the Risikopf shortly after the catastrophe, states that the piece of the mountain which fell measured upwards of 1,200 ft. across. The stream of rock and rubbish left after the fall in the valley was a mile long, and from 900 ft. to 1,200 ft. in width, while the area it covered was about 570,000 square mètres. There were several blocks of rock weighing upwards of 3,000 tons hurled down into the valley from a height of 1,800 ft.; and the total quantity of rock and earth which fell was estimated at from 15,000,000 tons to 20,000,000 tons. The geological character of the mountain at Elm is varied, one portion consisting of limestone, and another of sandstone, while, in addition, there were layers of marl and slate belonging to the tertiary formation. The inhabitants of Elm had been chiefly occupied in quarrying the better and harder portions of this slate. In order to obtain these they had for years been blasting and removing the softer and comparatively valueless portions of the slate, so that the side of the mountain above the village was completely honeycombed with galleries. This undermining of the mountain, in fact, had a great deal to do in bringing about the calamity. After the great fall of September last year, it was soon discovered that there was still a large portion of the Risikopf in a dangerous condition. With some difficulty a cannon was got into position, later in the autumn, and for many days a bombardment was kept up at the crumbling hillside, with a view to bring it down; but without success. It was last winter predicted that within a few months that portion of the Risikopf west of the first fall would be sure to come down, bringing with it a mass of rock and earth nearly three million tons in weight. In the worst case the predicted fall would sweep away that part of the village of Elm which escaped last September.

As we have above intimated, the slip which had been so clearly foreseen has at length taken

place, though its dimensions proved but trifling compared with what has yet to come. It occurred on Saturday, the 10th of June. The authorities had been keeping up a regular series of measurements, in order to ascertain whether and how fast the loose part of the mountain was moving. It was found that between December, 1881, and May, 1882, the upper part of the Risikopf had slipped 70 centimètres in a downward direction, while the crack which separated the moving part of the mountain from the rest of the Risikopf had grown nearly 5 ft. wider. Fortunately, the direction of the motion was rather more to the east than towards the village of Elm. The top of the mountain was slowly but surely separating itself from the rest. Between the 30th of May and the 12th of June the crevices at the back of the Risikopf had increased their width by 6 to 8 centimètres. The noise of the moving mass had ceased during the winter, but in the course of the month of May it became quite perceptible again. At length, at four o'clock on Saturday, the 10th inst., a mass of the mountain, as large as several houses in one, was observed first slowly to bend forward and, gradually accelerating its speed, it at length fell, taking the direction of the hollow which had been left by the slip of last September, and finally scattering itself over the *débris* left on that occasion. The fall was again accompanied by a loud crashing noise, which was clearly heard at the village of Matt, some miles away. Many thought that the whole of the top of the Risikopf had come down. In the course of the evening separate pieces of rock, earth, and stones commenced falling, and continued doing so through the night. This caused the inhabitants to withdraw from the village until the morning when the true state of things could be ascertained. Before daybreak, however, the loose stones and earth had ceased falling, and when daylight came it was seen that notwithstanding the mass that had fallen there was no material alteration in the general shape and contour of the Risikopf. On the following two days the mountain was ascended and examined, when it was found that a piece of the mountain of several thousand cubic mètres on the east side had fallen eastward, and another smaller portion on the western side had fallen in the direction of Elm. The blocks of rock, however, had not fallen as far as the bottom of the valley.

The most important result of the investigation was that the quantity which fell on this last occasion hardly amounts to one-hundredth part of that portion of the Risikopf which is nearly ready to fall. When the great slip takes place, the mass which will come down will immensely exceed even the great slip of last September. Loose stones and earth are now incessantly falling, and the catastrophe may take place at any moment. It is found that the entire top of the Risikopf is now moving *en masse*, and the result of all the observations is to show that the whole of it will probably come down at one time, or in two or three parts at most. It was hoped that the mountain would at length settle, but this hope is now abandoned, as, since the winter, its motion has been constant. It is not yet possible to judge whether the fall of the chief mass will be towards Elm or in an other direction. In any case, every day is bringing us nearer to the most tremendous landslip known in Europe for generations past. Naturally, the inhabitants of Elm are in a constant state of trepidation. In order to hasten the final catastrophe, it has been proposed to bombard the lower portion of the moving mass with far heavier artillery than that which was employed before.

The Victoria (Philosophical) Institute.—At the annual meeting of this Society, held at the House of the Society of Arts, the Earl of Shaftesbury, K.G., in the chair, the honorary secretary, Captain F. Petrie, read the report, from which it appeared that the total number of members was now upwards of 950, Professor Pasteur and many other well-known men of science having joined the Society in the past year, during which papers and short communications written in furtherance of the Society's objects,—namely, the investigation of philosophical and scientific questions, especially those said to militate against the truth of Revelation,—had been contributed by several scientific men at home and abroad.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE annual dinner in connexion with this association took place on the 15th inst. at the Grand Hotel, Colmore-row.

Mr. J. A. Cossins, who presided, proposed "The Birmingham Architectural Association," and urged that it was the duty of each member of the association to do all that he possibly could to ensure the success of the association. Another important matter which he trusted their association would promote was one that he was reminded of by a circumstance in connexion with Mr. Ruskin. When Mr. Ruskin's "Seven Lamps of Architecture" first made its appearance and astonished the world, some unfortunate architect wrote to the papers and expressed a strong desire that Mr. Ruskin had put in an eighth lamp, and that was the lamp of "making a living." To ensure the desired end, the first requisite was to gain the entire confidence of their clients and the public. He was sorry to say that that confidence had been somewhat shaken by a few black sheep who had gained profits where they should not have done. They would lose the confidence of the public unless that practice was stopped.

The chairman next proposed "The Profession," and spoke of the wonderful change which had taken place, during his time, in the public taste as affecting styles of architecture. He remembered that when he was first articled the "Battle of Styles" was raging, and that while some pointed to the Post Office in London as the purest and best style, others pointed to the Houses of Parliament. For domestic architecture Barry's Italian style was thought to be everything that could be desired, and it had almost arrived at finality. It would be very interesting to think what architecture would be in twenty years. He had seen during his connexion with the profession the predominance for a time of Egyptian, the Moorish, the Greek, Roman, Italian, Romanesque, Italian Gothic, pure English Gothic, free adaptation of Gothic, and the style of Queen Anne.

Mr. Henman, in responding, said he was glad that the subject of competitions was being placed upon a somewhat better footing, and he was anxious to see the necessity of diplomas more widely recognised.

Mr. Dunn proposed "The Kindred Arts," and referring particularly to art metal work, coupled with the toast the name of Mr. J. W. Tonks, who responded.

The remaining toasts were "The Honorary Members," "The Retiring President and Committee."

SALES OF SHARES IN VARIOUS PUBLIC COMPANIES.

VALUE OF GAS SHARES.

LAST week Messrs. Fox & Bousfield held a sale of shares in several public companies, at the Auction Mart, Tokenhouse-yard. Amongst others the sale included 500 10*l.* shares, fully paid up, in the Lea Bridge District Gas Company, being a fresh issue, under the statutory powers of the company for increasing the capital. It was stated that the purchasers would be entitled to a dividend at the rate of 7 per cent., with an advance on such dividend corresponding with the reduction in the price of gas supplied. The particulars announced that the area over which the company had powers of supply comprised the whole of the parish of Walthamstow, and a portion of the parish of Leyton, in both of which parishes building was going forward at an enormous rate with a corresponding great increase of population, the districts having assumed the character of a metropolitan suburb. There was a very large attendance at the sale, and the auctioneer, in introducing the property, incidentally adverted to the threatened competition by the Electric Lighting companies, observing that there was little probability of their injuring the gas companies to any appreciable extent, one consequence of the electric light agitation having been to induce the gas companies to manufacture better gas, whilst they were also reducing their rates, with a corresponding increase of dividend to the shareholders. The stock was offered in lots of ten shares each, all the shares readily finding purchasers at prices ranging from 11*l.* 10s. to 12*l.* per share, representing a premium value of from 15 to 20 per cent. per share.

The next property offered comprised twenty 100*l.* shares in the New River Company, which were all sold at 385*l.* and 390*l.* per share. A fortieth portion of a king's share in the same company was sold for 1,500*l.*

Amongst other stock submitted were 100 10*l.* shares, fully paid-up, in the Bedford Park Estate Company at Chiswick. The particulars stated that the Company was formed in 1881 to purchase the estate, and develop on a more extended scale the successful enterprise of its then proprietor. The capital is 125,000*l.* in shares of 10*l.* each, entitled to a preference in capital, and a cumulative preference dividend of 5*l.* per cent. per annum, and a bonus of 25 per cent. on redemption. It was stated that for the half-year ending February last an interim dividend of 5 per cent. was declared. The property was sold in lots of ten shares each, realising only 8*l.* 15s. per share.

Amongst the other shares offered and sold were five 10*l.* shares, fully paid, in the Langham Hotel Company, the last dividend on which was at the rate of 10 per cent. per annum. They realised 17*l.* 5s. per share each.

A NEW WORKHOUSE FOR WANDSWORTH AND CLAPHAM.

THE Wandsworth and Clapham Board of Guardians have just resolved upon the erection of a large and costly new workhouse, in consequence of the present building being too small for the number of inmates. The decision was arrived at last week's meeting of the Board. The motion for the erection of the proposed new workhouse having been made, some of the guardians opposed it, and Mr. Barr moved an amendment to the effect that there was ample room on the present site to provide accommodation for the inmates, and that there was no necessity for a new workhouse. He urged that the space in front of the present workhouse might be utilised as a site for the enlargement of the house; but the Rev. Canon Erskine Clarke reminded the Board that the Local Government Board had refused to sanction plans to enlarge the workhouse on the present site. In the course of the discussion Dr. Longstaff, in supporting the proposal for the erection of a new building, strongly condemned the practice of giving out-door relief as the most extravagant system ever adopted in the world. To spend thousands of pounds in enlarging a workhouse or in building a new one was really more economical than in granting out-relief. The Chairman said it was far better to build a new workhouse than enlarge the old one. Patchwork was a most expensive way to build. The proposal to erect a new building was adopted by a majority of twelve to four, and it was further resolved that ten acres of land, offered by Mr. Davis, near Allfarthing-lane, at 1,000*l.* an acre, be purchased as a site. The land for the proposed new building will, therefore, cost 10,000*l.*, and the estimated cost of the building itself is set down at about 30,000*l.*

A CHAT ABOUT ROCKWORK.

WE all love rocks and like to imitate them in our gardens, but the materials at our disposal are very few and not easily managed. Brick burrs most of us have had a turn at, but do what we will with them we cannot, somehow, make them look anything but what they are, so we stick in plants as thick as we can and trust to providence to cover them up as quickly as possible.

Then they are so heavy we want quite a formidable foundation to support them, and if we want them for our conservatory floor we must carefully examine our supports before we venture on the extra weight. Do what we will they will not look like rocks; rocks have no rectangular edges,—rocks are not all 4½ ft. by 3 ft. melted together of a dirty yellow colour with black patches here and there: so brick burrs, having answered their purpose until structural alterations have become necessary, are smashed up at last, mixed with mortar, and pitched in for foundations, for which they are excellently well suited.

Then cork had its season. Quite barky and rustic it looked; everybody was delighted. Bundles of cork might be seen going in all directions, easily fixed, light, of a capital colour and surface.

We all cried "Eureka!" and thought the problem solved at last.

Well, after a bit we began to question our gardeners in this fashion:—"How is it," said we, "those seedlings are all eaten, and those young shoots all gone?" "Can't help it," says our gardener; "shall never get anything to grow as long as that cork stays there." "Cork," say we, "what's the matter with that?" "Just look here, sir," says our gardener, pulling down a piece; "stand on one side or you will be covered with insects." We do as we are bidden, and, to our disgust and astonishment, we see at the back of our beautiful cork dozens of creeping things running in all directions.

"Take it all down carefully, gardener," say we, "don't shake it; put it all into the fire and give the place a good lime-whiting."

We have heard of the Smithsonian system of rockwork, so we inquire about it. Nothing in nature is half so wonderful. Nature only makes a waterfall here and there; peaks and ravines are miles and miles asunder; lakes and snow-clad mountains are scattered over the earth's surface; but by the Smithsonian system all the wonders of the world can be produced in a back garden, 14 ft. by 10 ft., at so much a foot super. Look what it saves in travelling,—the hotel expenses, the loss of time,—by this system! When you want to see Niagara you have only to turn a tap, and you produce Mont Blanc with a pail of whitewash and a mop. Then the cost (we are not all Mr. Mantalinis), we must consider that. The cost is our stumbling-block, so we must leave the Smithsonian system to our millionaires, and see if we cannot afford something cheaper. What we want is something light, so as to be easily handled; porous, so as to hold water and mould; of an irregular shape, so as not to suggest waste building materials, that can be adapted to any circumstances and fixed by any one, and not too expensive, or we shall not be able to afford it, and that can be produced in any quantity.

Well, I have been pottering at the matter for some years, and I really think I have at last got the very thing, and I fancy the best way will be to produce it in blocks about 1 ft. across, and one half the height, of an irregular conical shape. I have seven colours,—black, brown, dull red, bright red, grey, dull yellow, and white, and I think I can sell these blocks, which will contain about half a cubic foot, at 6d. each.

There will be a show of horticultural matters at the Agricultural Hall next month, from July 24th to August 5th, and I have engaged a space in the centre of the hall where I shall show, amongst other matters, the rockwork I speak of, and as it might be easily overlooked, I have drawn your attention to it.

Some samples I will also send to my place in the Poultry, No. 35, and some to my shop in Bunhill-row, No. 121, so that if you are interested in the matter you will know where your curiosity can be gratified. If you have any taste for rockwork buy the raw material and see what you can do with it. If you do not like it you can break it down and build it up again; put the dark rocks at the bottom, and perhaps in time, if Nature has blessed you with genius, even the Smithsonian system itself may not be beyond the reach of your ability. W. H. LASCELLES.

THE CORN EXCHANGE, LONDON.

THIS building has been recently erected in Mark-lane from the designs and under the superintendence of Messrs. I'Anson & Son, of Laurence Pountney-hill. It occupies not only the site of the old Corn Exchange, but also that of 52, Mark-lane, which adjoined it on the south side, and was acquired to enlarge the market. The total area of the site is about 19,400 superficial feet.

The new Exchange consists of a front block next Mark-lane, containing on the ground-floor the vestibule, and on the first floor a flour-room. In the rear of this is the market, consisting of a large central hall or nave, 120 ft. long by 60 ft. wide and 68 ft. high in the centre, surrounded on three sides by aisles 20 ft. in width. The nave is divided from the aisles by arcades of grey Kenmay polished granite columns and Portland stone arches. The columns are of the Doric order, 2 ft. 6 in. in diameter at the base and 18 ft. high, and are placed 20 ft. from centre to centre. The roof of the nave is carried by semicircular wrought-iron ribs, 20 ft. apart, springing from the string-course which surmounts the arcade, and they are continued over the aisles in a quadrant form down to the floor-level, where they are tied by the girders which carry the floor.

The aisle roofs are glazed on Rendle's system, with copper grooves, and the glass used, both in aisle roofs and in the lights of the roof over the nave, is Hartley's rolled plate. The ground-floor is constructed with the Dennett arch, and is laid with a floor of cubes of wood in iron frames grooved on the surface (Westwood's patent). Below are two tiers of vaults with ventilating-flues in the thickness of the wall.

The building has a frontage only on Mark-lane, which is the subject of our illustration. At the eastern end it communicates with a subscription-room and refreshment-rooms, and there is a way through into Seething-lane. The plinth of the façade is of Kenmay grey unpolished granite; the ground-floor and attic of Portland stone, and the shafts and columns of pilasters of red Aberdeen polished granite. The length of the frontage is 105 ft. The Exchange has been built in sections, and the business of the market has been uninterrupted by the rebuilding.

Mr. William Barlow, Engineer of the Midland Railway, was consulted with, and advised as to the construction of the iron ribs which carry the roof.

The lighting of the Exchange as to the aisles is by a glass roof, which follows the form of the iron ribs by which it is supported, and as to the nave, by ranges of vertical lights, between which are horizontal spaces forming a ceiling below and gangways above for access to the machinery by which the vertical side-lights are opened all round the building for the purposes of ventilation, for access to the blinds, and, on the lower gallery, to water-pipes, by means of which the glass roof of the aisles may be flooded.

Messrs. Adamson & Sons, of Ealing, were the builders, and Mr. Merrifield was clerk of works.

THE ROOF OF THE CORN EXCHANGE, MARK-LANE.

As a supplement to the external view of the Corn Exchange and the particulars given in our present number, we reprint a description of the iron ribs and the roof, read by Mr. Edward I'Anson, F.G.S., at the General Conference, held on June 7th, 1878:—

The old Corn Exchange, in Mark-lane, London, having fallen into decay, and the market, which had already been considerably increased by an addition to the area of the original market space, being still insufficient, an adjoining piece of land has been acquired, and a new Exchange is now in course of erection on the enlarged site. The building will be about 100 ft. in width, and after long deliberation it has been determined that it shall consist of a block about 40 ft. in depth next Mark-lane, containing, on the ground-floor, the staircase, vestibule, &c., and on the first-floor a flour-room; and in the rear of this block a central area or nave, surrounded on three sides by aisles. The nave will be 60 ft. in width, and the aisles each 20 ft. The nave is separated from the aisles by an arcade, the arches of which have a span of 20 ft., and the height to the top of the cornice over the arches is 30 ft. measured from the floor. The roof over both aisles and nave is carried by curved ribs of wrought iron, each of which springs from the floor; has a span of 100 ft., and rises to a height of 61 ft. 9 in. from the floor; and is seated over one of the columns of the arcade. That part of the rib which spans the nave is semicircular. At the floor level each rib is bolted down to the brick pier built to receive it, and secured to one of the iron girders which, running across the Exchange from side to side to carry the floor, acts also as a continuous tie applied at the springing or lowest part of the rib. The iron ribs, like the columns of the arcade dividing nave and aisles, are 20 ft. apart from centre to centre. As to the construction of the roof, which has been the result of most careful consideration, I do not here propose to make any remarks, my present object being only to describe the iron ribs which it has been decided to use in order to carry it.

The profile of the rib having been determined, the question was what section should be given to it, and under the advice of Mr. William Barlow, the well-known engineer, the following dimensions have been adopted:—The depth of semicircular portion which spans the nave is at the apex 2 ft., and gradually increases until at the point where it springs from the top of the nave arcade it is 3 ft. 10 in. in depth. The depth of that portion which spans the aisle is, for the vertical part 1 ft. 9 in., and for the curved part 2 ft. The rib is made up of top and bottom plates, web and angle irons. The dimensions of these parts are (with the exception of the web which, as before stated, varies in depth) uniform throughout, and are as follow:—Top and bottom plates, 11 in. wide and five-eighths of an inch thick; angle irons, 4½ in. by 4½ in., and five-eighths of an inch thick; web, three-eighths of an inch thick.

The ribs have a tie at the feet, as already described. It will be observed that the object to be attained was a rib which should bear upon the arcade but exercise no thrust upon it, and that the whole rib, securely fastened at the bottom, should be perfectly rigid throughout. In order to test the capabilities of the rib, a small tin model was made, and being heavily weighted showed a tendency to rise from its seating on the arcade, demonstrating the necessity for giving considerable stiffness to that part of the ribs which would span the aisle. This model represented, correctly to scale, the span and height of the rib, and also its profile, but did not represent with anything like accuracy the sectional areas.

On Mr. Barlow's advice a model was made of two ribs one-fourth full size. These were constructed of wrought-iron and built up with flanges, plates, and angle irons, all riveted together; they were accurate representatives in every detail of the proposed ribs. They were made by Messrs. Moreland, and carefully tested at their works in Old-street, St. Luke's, by Mr. Barlow.

To conduct the test they were placed on balks of timber, at the proper distance apart, and tied at the feet by iron ties. They were connected by purlins of iron placed in the exact position the purlins will occupy in the work. There were six purlins in all, three on each side of the roof, and all placed at levels above the springing of the rib from the arcade; that is there were no purlins on that part of the rib which spans the aisle. As in the building the load will be received by the purlins, and by them transmitted to the rib; the test loads were suspended from the purlins also.

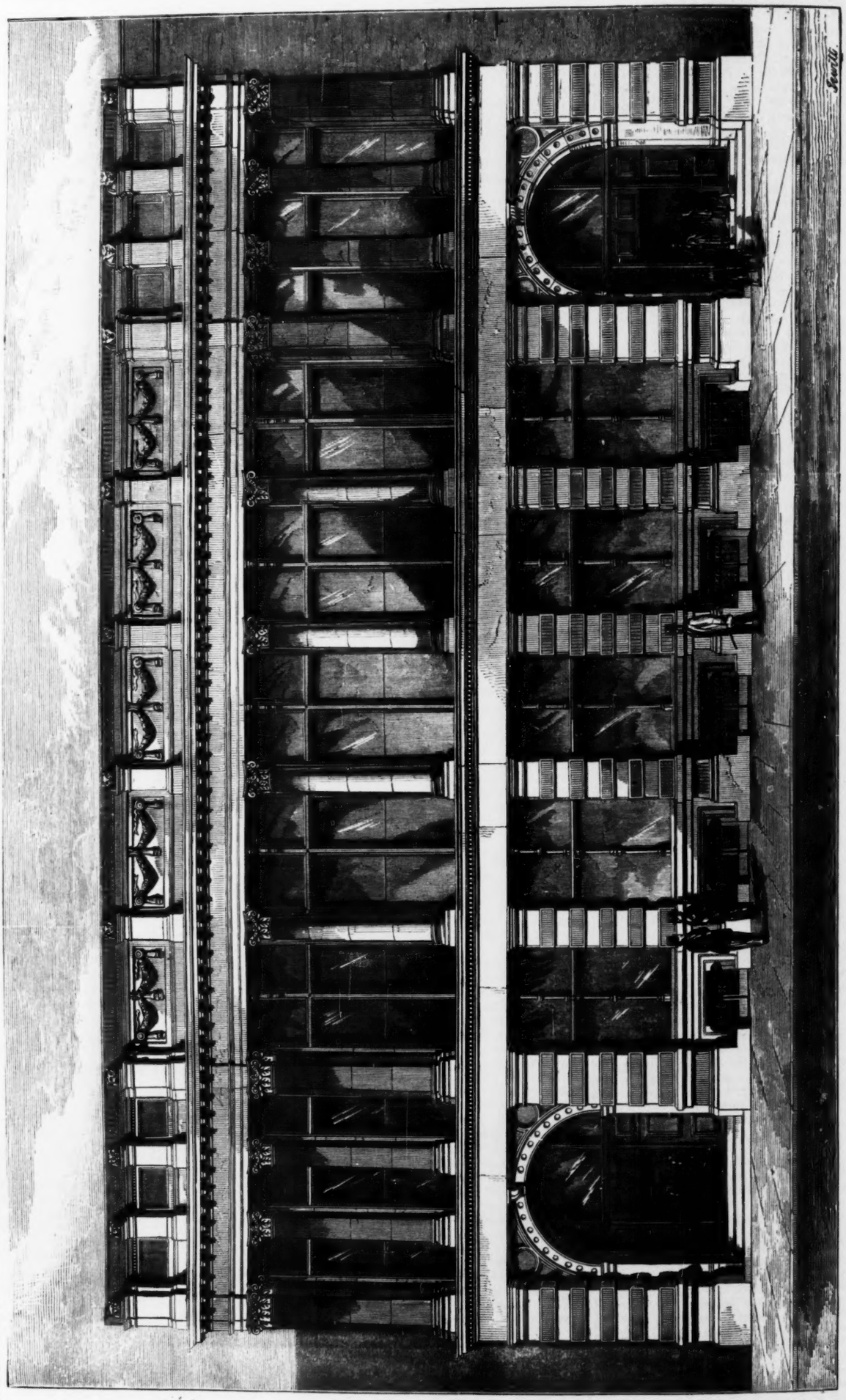
The following is a table of the loads successfully applied, and the resulting deflections, the loads being in cwts. and the deflections in inches:—

Load on lower Purlin.	De-flexion.	Load on middle Purlin.	De-flexion.	Load on top Purlin.	De-flexion.
6¾	·01	6¾	·06	6¾	·07
10	·01	10	·06	7¾	·08
15	·03	15	·11	11¼	·13
20	·05	20	·16	15	·19
25	·06	25	·19	18¾	·24

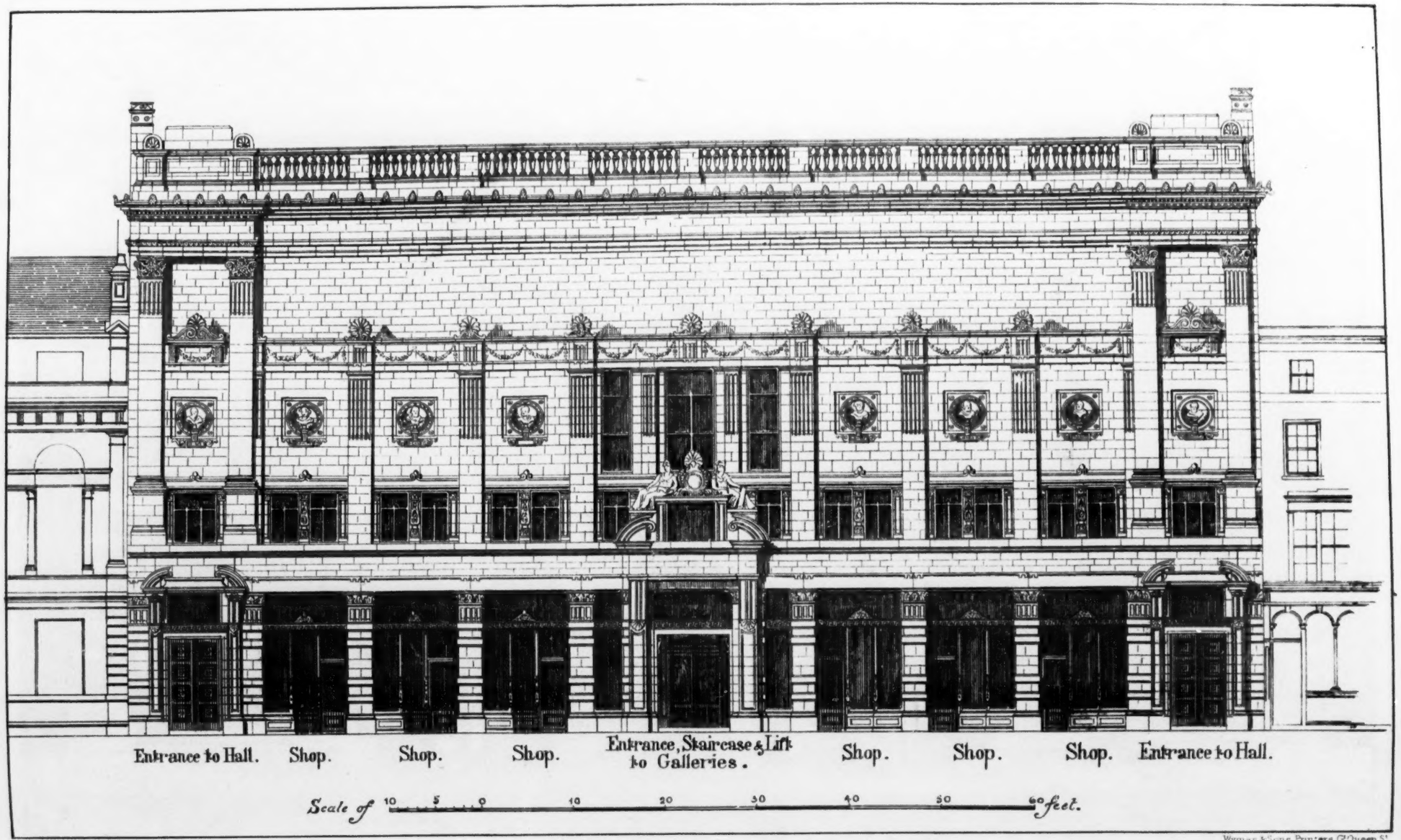
Under the last load, viz., 25 cwt. on lower purlin, 25 cwt. on middle purlin, and 18¾ cwt. on top purlin, the extrusion at the point where the rib springs from the nave arcade was ¼ in. on each side; that is ½ in. for the entire span from arcade to arcade.

The greatest load applied to the model was equivalent to about one and half times the calculated maximum of dead load which the rib will have to sustain in the building. When the weights were removed the model ribs resumed precisely their original form, no part having shown signs of undue strain.

A Long-needed Improvement.—At the meeting of the Holborn District Board of Works on Monday last, the Chairman called the attention of the Board to the circumstance that if they wished to memorialise the Metropolitan Board of Works in favour of making the new street from the corner of Liquorpond-street and Gray's-inn-road to the Angel at Islington, the time for doing it was by July the 1st. Mr. Davids moved that the memorial be adopted and sent to the Metropolitan Board of Works. The motion was carried, and the seal of the Board affixed to the memorial. It is high time that this necessary improvement was carried out. The perils (to say nothing of the wear and tear of horseflesh) of the ascent and descent of "Mount Pleasant," and of the constricted bottle-neck known as Elm-street, are only too obvious to those who are familiar with the locality.



THE CORN EXCHANGE, LONDON.—MESSRS. T'ANSON & SON, ARCHITECTS.



THE PICCADILLY ART GALLERIES.—Mr. Edward Robert Robson, Architect.

Whiteman & Bass, Photo-Litho, 236 High Holborn.

Wyman & Sons, Printers, 74 Queen St.

ROME

EXCAVATIONS IN THE FORVM BETWEEN
THE TEMPLE OF ANTONINVS AND FAVSTINA
AND THE ROVND TEMPLE CALLED
THE TEMPLE OF ROMVLVS
MARCH. M.D.CCC.LXXXII.

March 1882

J. Thomas Bury

C.F. Kell, Photo-Litho, Castle St Holborn, London, E.C.

Wyman & Sons, Printers, 74 Queen St

ROME
THE VELIA

C.F.Kell, Photo-Litho. Castle St Holborn, London, E.C.

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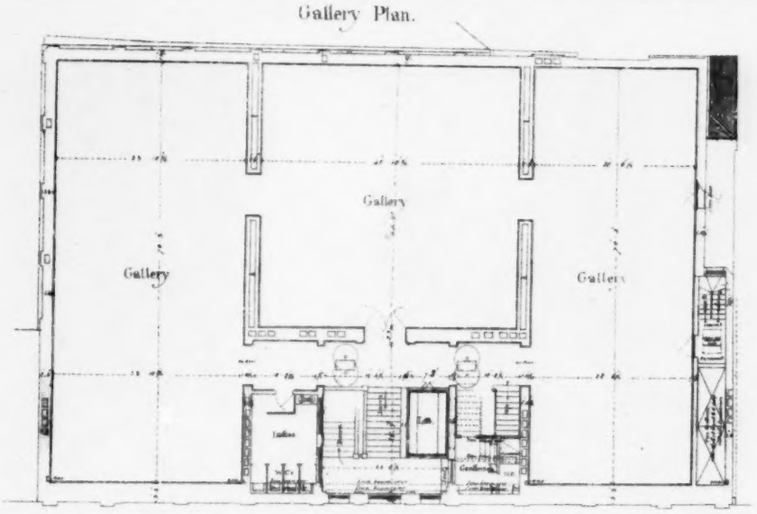
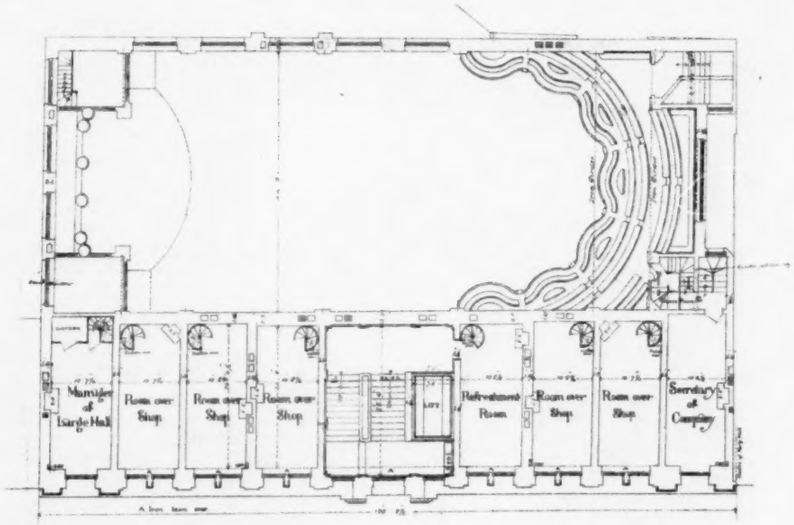
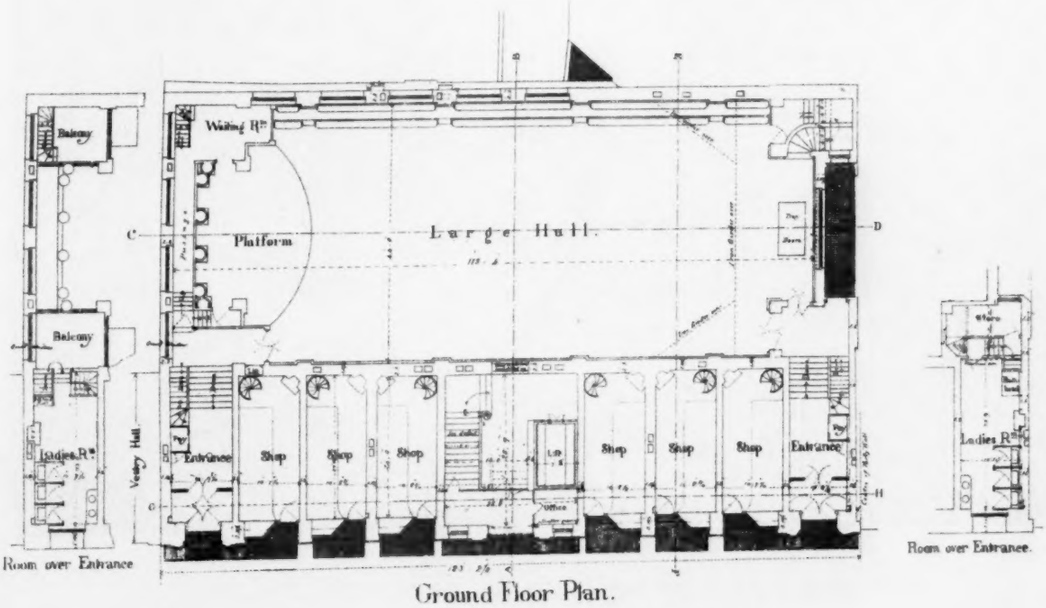
Gallery Plan.





Mezzanine Plan



Ground Floor Plan.

Scale of feet

Whiteman & Bass *Photo-litho*

THE PICCADILLY ART GALLERIES.

Wyman & Sons, Printers.

ENTRANCE DOORWAY OF THE CASA DELS GRALLAS, BARCELONA.

THE PICCADILLY ART GALLERIES.

THE Piccadilly Art Galleries Company has been formed to provide a proper place for the annual exhibition of the works of painters in water-colour, and to do, in short, for the essentially native art of water-colour painting what the Royal Academy does for oil-painting. Although the galleries will be let to the Institute of Painters in Water-Colours, the exhibition will be open to all the world. The chairman of the company is Mr. W. L. Thomas, the managing director of the *Graphic*, and himself an artist in water-colour.

The building comprises six shops towards Piccadilly, each having a basement below and a mezzanine above. At the rear, occupying the whole length of the building, is a fine hall, intended to be used for various purposes, such as music, public meetings, &c., much in the same way as Willis's Rooms are used. Over the whole building are the picture galleries, lighted, of course, from the top.

The design has a pronounced Greek motive, while the natural severity of the style is modified by the free treatment of the doorways and of the mezzanine story with curved lines, also by a line of festoons extending the entire length of the building. Portrait busts of eight of the fathers of water-colour art will be placed in sunk recesses along the wall. Along the whole length of the upper portion extends a large space of blank wall, forming a contrast to the ornate carving below.

We understand that the lighting, warming, and ventilation of the galleries have received special consideration. The front is constructed of Portland stone from the Whitbed quarries. The main staircase is of stone from the Craigleith quarries, near Edinburgh.

The architect of the building is Mr. Edward Robert Robson, F.S.A., whose aim seems to have been to take possession of the entire front as a gallery of art. When the building is completed we shall be able to judge more accurately of the artistic merits or demerits of the design as a whole. The basement portion of the building was executed by Messrs. Holland & Hannen, whose tender, however, did not prove the lowest in the competition for the main structure. This has been entrusted to Messrs. Peto, Bros. The clerk of works is Mr. James Softly. The cost, exclusive of site, furniture, and other expenses, will be over 30,000*l*.

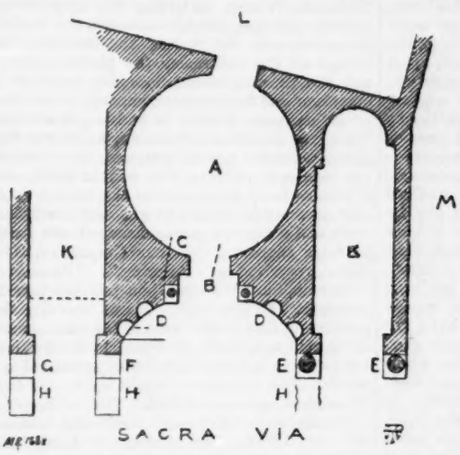
ROME:

EXCAVATIONS IN THE FORUM ROMANUM.

To those who have not very recently visited Rome, the Forum would now present an entirely changed appearance. Under the new *régime*, the work of excavation and clearance has been gradually pushed forward, and now one can walk uninterruptedly from the Velia to the foot of the Capitol, on the ancient level of the Forum. The excavations of 1873 had exposed the space in front of the Temple of Antoninus and Faustina, and those of 1878-9 had laid bare the Sacra Via in front of the so-called Temple of Romulus; but it was not until this year that an attempt was made to remove the accumulations of soil on which ran the road from the Via in Miranda to the front of S. Maria Liberatrice, and which, almost bisecting the Forum, covered a large area of unknown ground. This work has now been accomplished, and the result is that many and important discoveries have been made, and nearly the whole Forum area is exposed. The full value of these discoveries is, perhaps, not yet known, nor can be fully appreciated until the space under the Church of S. Maria Liberatrice be explored; but, although the proceedings are, for the moment, in abeyance, permission to pull down this unimportant building and excavate its site is expected shortly to be obtained.

Among the most interesting discoveries made are those in connexion with the Sacra Via itself. We can now follow it from the Arch of Titus, down the slope of the Velia in front of the steps of the Temple of Venus and Rome, bending round by the Basilica of Constantine, and skirting the Temples of Romulus and of Antoninus and Faustina, beyond which, for the present, it disappears under the road to the old houses backing on to the Forum of Nerva. But in front of the Temple of Romulus, immediately before the third pedestal shown in the illustration, the road divides, and the branch appears to be clearly traceable under ancient super-imposed pavements, past the Temple of Vesta and the front of the Temple of Castor, where, at the angle of this building, it joins the road by the Basilica Julia, where it is crossed by the Vicus Tuscus. In the *Times* of the 8th of May last, a very clear sketch plan is given, showing this newly-discovered piece of road.

By the side of this bifurcation in the Sacra Via stands what still remains of that archæological puzzle, the so-called Temple of Romulus, —perhaps more properly named the Temple of the Penates. Until recently, the circular portion of it formed the porch of the church of SS. Cosmo e Damio, and another part flanked by two marble columns, the upper parts only of which were visible, formed the church of the Amanti di Gesu e Maria. This latter church has now been destroyed, and the remains, cleared of their rubbish and *débris*, present the plan herein sketched. The round



temple of Romulus is at A, with its entrance at B, having an enriched marble architrave with cornice over, carried by a pair of porphyry columns. This entrance has but recently been reset in its original position and level, it having been altered by Urban VIII. to the position dotted on C, so as to be opposite the connexion made to the Church of SS. Cosmo e Damio behind, shown at L. At D are two curved brick wing walls, with niches therein spreading to the same width as the temple, and extending forward to what may have been a screen or colonnade added at a later date. Of this colonnade, two columns with their plinths stand erect at E, and at F the plinth only remains *in situ*, whilst the brick foundations of a fourth column are seen at G. The column nearest the wing wall is still surmounted by its capital and cornice complete, and in the illustration, close to the point at which the work of excavation is proceeding, will be seen a corresponding fragment of the entablature. At H are the remains of rough brick foundations, between which, no doubt, were the steps from the level of the Sacra Via. On each side of the temple at K was a long apsidal chamber unconnected with the temple itself, and one of the apses remains perfect. How the cornice of the front screen was finished it is difficult to say. That it was carried across from column to column is evident from the worked returns on the portions of the entablature remaining; but the means by which the intermediate parts of the cornice were supported are not now evident. Perhaps a screen wall, like that behind the two columns remaining of the Forum of Nerva, but which has since disappeared, stood immediately in the rear of the columns; and this may have followed the line of the curved wing walls, as between the plinths E and F no foundations have been found beyond those required to support steps.

At the side of the Church of SS. Cosmo e Damio considerable excavations have been made in the site of the street which ran from the Sacra Via up to the Carinæ before the erection of the Basilica of Constantine, but we have not space now to enlarge further on these or the discoveries made near the Temple of Vesta; enough, however, has been said to show that just now the works in progress in the Forum, as well as the clearances behind the Pantheon, are of extreme value to all who are interested in Roman archæology.

Our two illustrations, showing the middle and the top of the Sacra Via, are reduced from views to be published in Mr. J. Tavenor Perry's forthcoming work on Rome, and the above account has also been abridged from his descriptions which accompany the volume.

ENTRANCE OF THE CASA DELS GRALLAS, BARCELONA.

IN the road of Porta Ferrisa, Barcelona, and facing the road of Pi, was erected, in the sixteenth century, the country seat of the family of Grallas, which later passed into the hands of the family of Medinaceli. About the middle of the present century the old mansion was pulled down to make room for a building of modern construction, and, as it appears, simply for reasons of symmetry with its surroundings, not because the modern edifice possessed greater merits than its predecessor. According to a Spanish writer, the old mansion was built in 1518, for Miguel Joan Gralla, professor of philosophy, Barcelona. In the same year, the learned Professor obtained special privileges from the Municipality, in consideration, it is said, of the beauty of the building which he had caused to be constructed, and which formed a conspicuous ornament of Barcelona. To show its importance, the words, "PUBLICE VENUSTATI, PRIVATA UTILITATIS," were carved on the pedestal of the columns supporting the entrance. The architect of the edifice is unknown. The windows of the façade,—six in the entresol, seven in the principal story,—are in the Corinthian style, richly decorated. The entrance, which we illustrate in this week's *Builder*, forms a semicircular arch, resting upon two columns and four pillars profusely ornamented, and supermounted by a rich Corinthian cornice, bearing the arms of the Gralla family. The courtyard of the old edifice was also remarkable. It contained twelve small columns, supporting arches of the Pointed style, and a beautiful staircase leading to spacious halls on the principal floor. This courtyard portion of the old building and the door of its façade, which is the subject of our illustration, have been rebuilt by the Marqués de Casa Brusi, on his estate at San Gervasi de Cassolas. Other portions of the ancient building are preserved in the neighbourhood.

THE RIGHT OF VENDORS TO KEEP THE PURCHASE-MONEY OF A BUILDING DESTROYED BY FIRE, AS AGAINST AN INSURANCE OFFICE.

IT may be in the recollection of some of our readers that, in the course of the years 1880 and 1881, an important case—that of Rayner *v.* Preston—was decided by the Master of the Rolls and the Court of Appeal. We pointed out, in our comments on that decision, that it was one of great interest to all persons connected with buildings, inasmuch as it finally decided that when the owner of a house has agreed to sell it, and it is burnt down before the actual completion of the contract, yet that the purchaser must pay the full price, and cannot recover from the vendor any sum which the latter may have received from the insurance company in respect of this loss. Of course, the practical effect of this decision was to make the vendor in a better position in consequence of the fire than if it had not occurred, since he gets both the full purchase-money and also the money from the insurance office. We likewise pointed out that, after this decision, no purchaser of buildings was safe, unless he either insured as soon as the agreement to sell was made, or had an agreement with the vendor that he, the purchaser, should have the benefit of his policy.

It was in consequence of this decision that the case now reported—namely, Castellain *v.* Preston ("Law Reports," 8 Queen's Bench Division, 613)—has been brought, being an action by the insurance company against the vendor to recover back the amount paid by the company in respect of the damage to the building, which, so far as the seller was concerned, never, as we have pointed out, was any injury at all to him.

It would serve no useful purpose to delay

giving the decision at which Mr. Justice Chitty, before whom the case was tried, arrived. He held that the insurance company could not recover back the sum they had paid, and therefore, unless this decision is reversed by the Court of Appeal, the vendor in this particular instance will keep both the money of the purchaser and also that of the insurance company, and so may any vendor in future under similar circumstances. We confess, however, to having grave doubts—if we may be permitted to have doubts of a judicial decision—as to the correctness of this judgment of Mr. Justice Chitty. It is so clearly inequitable, so completely against all notions of justice, that we do not believe it can be upheld. In a previous and not dissimilar case, tried in 1880—namely, that of Darrell *v.* Tibbitts, Law Reports, 5 Queen's Bench Division 560—the Court of Appeal held that an insurance company could recover back from the insurer whose tenant, by the terms of his lease, was bound to make good any damage occasioned by a gas explosion, a sum paid to the lessor in respect of such damage. Now, apart altogether from the doctrine of subrogation, which clearly applied to this case, it appears to us that there are passages in the judgment of Lord Justice Brett which cover the present case. For this is what we find in the report:—"The question now arises whether the insurance company, who paid the money to the landlord at a time when they were obliged to pay by virtue of their contract, can recover it back because the tenants have done that which they could not avoid doing? If they had not repaired, they must have paid damages to the landlord. If the company cannot recover the money back, it follows that the landlord will have the whole of his loss as to the building made good by the tenants, and will also have the whole amount of the loss paid by the insurance company. *If that is so, the whole doctrine of indemnity would be done away with; the landlord would be not merely indemnified, he would be paid twice over.* A technical difficulty arises in my mind as to the ground upon which the landlord can be held liable in this action, but *it is a difficulty which ought to be surmounted.* . . . . It seems to me that, according to all rules of law, we have a right to imply a promise on the part of the landlord to the insurance company, at the time of payment by them, that if the loss should be afterwards made good by the tenants, he would repay the money which he received from the insurance company." Now, we confess to some astonishment, seeing the obvious justice of the thing, that Mr. Justice Chitty did not find this passage a sufficient authority to enable him to decide against the seller, without going into all sorts of elaborate discussions upon the doctrine of subrogation, and upon American cases. Because, why should not the Court imply a promise on the part of the seller, at the time of payment by the insurance company, that if the loss should be made good by the purchaser, he would repay the money received from the company? In fact, equity would consider the vendor a trustee for the company of so much of the purchase-money as equalled the sum paid by the insurance company. It seems to us that upon these two short grounds the Court of Appeal will have no great difficulty in reversing the judgment of Mr. Justice Chitty. Otherwise, as Lord Justice Brett said in the passage quoted above, "the whole doctrine of indemnity will be done away with." It is not for us to enter closely into the legal arguments with which this question abounds; but it is one of so much practical importance that it was not possible to pass it by without showing how the law stands at present by reason of the decision in Rayner *v.* Preston, and of the recent judgment of Mr. Justice Chitty in Castellain *v.* Preston; nor, having stated what the law is in consequence of this last judgment, would it have been just to our readers to leave them under the impression that it was likely to remain unaltered by the Court of A peal.

The Rowland Hill Statue, near the Royal Exchange, was unveiled by H.R.H. the Prince of Wales on Saturday last. Mr. Onslow Ford is the sculptor. The statue has been cast in bronze by Messrs. Young, of Pimlico. The pedestal, which is of Scotch granite from the works of the Dalbeattie Company, bears the inscription,—"Rowland Hill: He Founded Uniform Penny Postage."

THE SALE AT KENSINGTON HOUSE.

SINCE Tuesday last Mr. Albert Grant's unoccupied mansion and the grounds attached, at Kensington, have been much crowded with visitors, who have availed themselves of the four days' sale of the materials to make an inspection of the costly mansion which, although erected at such an enormous outlay, has never been permanently occupied, and is now about to be demolished in order to clear the site for other and more available buildings. The materials sold on Tuesday consisted, for the most part, of the fittings of the upper rooms in the central portion of the building, including the thirteen copper baths and the marble chimney-pieces; and these, together with the lead and iron in the roof of the structure, which realised upwards of 1,100*l.*, bought up the proceeds of the first day's sale to upwards of 2,500*l.* Wednesday's sale, including the magnificent marble staircase, marble columns, the marble terrace outside the rear of the mansion, the fittings of the ball-room, the picture-gallery, and the drawing-rooms, brought together a numerous and fashionable company, in addition to the ordinary dealers in building materials. The great attraction of the day's sale was the grand polished marble staircase, described in the catalogue as being 6 ft. 6 in. in width, and extending from the ground to the second floor, with ornamental white and gilt cast-iron balustrade and bird's-eye maple handrail, the lower landings supported by four Caryatides, 8 ft. high, representing "Spring," "Summer," "Autumn," and "Winter," on polished marble pedestals, 3 ft. 6 in. high. It was stated in the particulars that in the event of the staircase not being sold as a whole it would be divided into lots; but, as it turned out, it was purchased as a whole. The auctioneer, in offering it, said that its original cost was 11,000*l.* The biddings for it commenced at 500*l.*, and finally the hammer fell at 1,000*l.*, the purchaser being Mr. Williams, who, it was stated in the room, intends introducing it into some buildings which he is now erecting at the West End. The sale of eight Italian marble-fluted Corinthian columns followed. They were described as being each in one piece, 15 in. in diameter, 12 ft. 6 in. high, with richly-carved capitals and moulded bases, on massive marble pedestals. They were sold in pairs, and realised 100*l.* a pair, the auctioneer stating that they cost 1,000*l.* per pair. The marble terrace at the rear of the building, containing 5,200 superficial feet, was sold for 130 guineas, and following upon this the materials in the ball-room were disposed of, four pairs of fluted Italian marble Corinthian columns, each in one piece, and 12 ft. 9 in. in height, realising 126*l.* per pair. The total number of lots sold during the day was 160, and the proceeds of the sale 3,600*l.* On Thursday the materials in the morning-rooms and cloak-rooms, the billiard-room, library, and banqueting-room were sold. The carcass of the building, in Portland stone, will be disposed of in about a month.

THE OXFORD MILITARY COLLEGE, OXON.

THE annual Speech-Day of this institution, which prepares candidates for Woolwich, Sandhurst, Home and Indian Civil Service, took place on the 21st inst. Lord Waveney, in the absence of H.R.H. the Duke of Connaught, who wrote to express his regret at not being able to attend, gave away the prizes to the successful competitors for military proficiency. Letters of regret were likewise read from Lords Hertford and Jersey, Colonel Sir Robert Loyd-Lindsay, Bishop Claughton, and many others. His lordship was seconded by General Burnaby, M.P., and Colonel T. Duncan, R.A.

The proceedings commenced with an inspection of the students on parade. After the riding, sword, lance, and carbine exercises had been gone through, the reports of the governor (General Desborough) and the disciplinarian (Colonel Macartney) on the military studies were read. The sword of honour given by Colonel Sir Robert Loyd-Lindsay to the student passing highest into Sandhurst and Woolwich was awarded to Mr. Reade; and another sword, given for military proficiency by Lord Waveney, was awarded to Mr. Hibbert. His lordship addressed the students at some length, and said that he was glad to find so much stress was laid by the college authorities upon the study of modern languages, the importance of which could not be well over-rated now-a-days. He complimented the students upon the able manner in which they had performed the various military exercises.

General Burnaby, M.P., said he, too, attached the greatest importance to the study of modern languages by military men, particularly that of French and German. Colonel Duncan said he was sure that if marks were given by the examiners for physical training, the students from this college would have a great advantage over those coming from other institutions. General Lorry proposed a vote of thanks to Lord Waveney.

THE METEOROLOGICAL SOCIETY.

THE closing meeting of this society for the present session was held on the 21st inst., at the Institution of Civil Engineers, Mr. J. K. Laughton, F.R.A.S., president, in the chair. The first paper read was on "A new Metal Screen for Thermometers," by the Rev. F. W. Stow, M.A., F.M.S. This screen differs from the ordinary Stevenson in the following respects:—(1) It is somewhat larger; (2) it has a single set of double zinc louvres; (3) it is partially closed at the bottom, to cut off radiation from the ground. The advantages claimed for the use of zinc louvres are:—(1.) The conductivity of metal causes the heat derived from the sun's rays to be distributed over every part of the louvres. (2.) The louvres being much thinner than those of wood, the circulation of air through the screen is not only much greater absolutely, but much greater also in proportion to the bulk of the louvres. (3.) The zinc louvres, therefore, are much more sensitive to changes of temperature than wooden ones. Comparative readings of thermometers in this screen, along with those in an ordinary Stevenson screen, were made during the summer of 1881. From these, the author is of opinion that the Stevenson becomes unduly heated when the sun shines, but this may be as much due to its small size as to the material of which the louvres are made. The thermometers in it are only 3 to 5 in. from the louvres at the back of the screen, against 7 to 8 in. in the zinc screen. The roof, too, is single, and the box is open at the bottom. The author also says that there is no need to condemn all wooden screens, but there does seem to be some reason to think that screens with metal louvres might be better.

THE SOUTH-EASTERN RAILWAY COMPANY AND THEIR BRIDGES IN SOUTH LONDON.

THE Newington Vestry are carrying their opposition to the Bill of the South-Eastern Railway Company (so far as it refers to the construction of new bridges within the parish) before the Committee of the House of Lords, with the view, more especially, of compelling the railway company to make the bridges absolutely water-tight. At the last meeting of the Vestry, the Works and Sanitary Committee recommended that a petition be presented to the House of Lords against the Bill as passed by the Committee of the House of Commons, with the view of amending the clause as inserted in the Bill for making the bridges water-tight, by striking out the words introduced by the Committee of the House of Commons, "or as nearly so as practicable." Mr. Marsland, in moving the adoption of the report, said he could not see how the Committee of the House of Commons allowed such impracticable words to be introduced in the Bill as "or as nearly so as practicable," for should the Bill finally receive Parliamentary sanction with those words in it, the vestry would have no security that the bridges would be water-tight, and the parish would in all probability be subject to the same nuisance from those dripping bridges which it had to endure for several years past. He therefore thought that they had very good grounds for appealing to the House of Lords. The recommendation was agreed to.

Josiah Wedgwood.—Mr. William J. Stuart delivered an interesting lecture before a large and appreciative audience, at his residence, in Gloucester-terrace, Hyde-park, on Wednesday, the subject being "Josiah Wedgwood, the Great Art Potter, and his Works."

STRAWBERRY HILL.

VISIT OF THE ARCHITECTURAL ASSOCIATION.

A MONTH ago we referred (p. 627, *ante*) to the rumour that this pleasantly-situated and curious house,—interesting not only in itself but from its associations with Horace Walpole, whose summer residence it was for half a century,—was sold, or was about to be sold, to an American company, who intended to convert it into an hotel. We understand that this rumour is well founded, and while we cannot but sympathise with the lamentation of a local journal that "no Englishman of opulence and culture can be found ready to secure the noble honour" of making the building his own, we think that the Architectural Association were well advised in taking advantage of an opportunity which offered itself last Saturday for making a special visit to a building of which they had often heard or read. It is true that references to it were, for the most part, significant of contempt for Horace Walpole's dabbling in Mediæval or quasi-Mediæval architecture, but, nevertheless, Strawberry Hill has some claims to regard as a curious precursor of the Gothic revival, and it is not surprising that a goodly number of the members of the Association took the opportunity of going over the house on Saturday last, under the guidance of Mr. Maurice B. Adams, who read some interesting notes on its chief features and associations, first of all quoting Horace Walpole's own description of it, in a letter addressed to Sir Horace Mann, and dated June 5th, 1747,—

"Where the Gothic castle now stands was originally a small tenement, built in 1698 by the Earl of Bradford's coachman, and let as a lodging-house. Cibber once took it, and wrote one of his plays here,—'The Refusal; or, the Lady's Philosophy.' After him, Talbot, Bishop of Durham, had it for eight years; then Henry Bridges, Marquis of Carnarvon, son of the Duke of Chandos, and since, the Duke himself. It was next hired by Mrs. Chevenix, the noted toy-woman, who, on the death of her husband, let it to Lord John Philip Sackville, second son of Lionel, Duke of Dorset; he kept it about two years, and then Mr. Walpole took the remainder of Mrs. Chevenix's lease in May, 1747, and the next year bought it by Act of Parliament, it being the property of three minors of the name of Mortimer."

"I may retire to a little new farm that I have taken just out at Twickenham. The house is so small that I can send it to you in a letter to look at. The prospect is as delightful as possible, commanding the river, the town, and Richmond Park; and being situated on a hill, descends to the Thames through two or three little meadows, where I have some Turkish sheep and two cows,—all studied in their colours for becoming the view. This little rural *bijou* was Mrs. Chevenix's, the toy-woman *à-la-mode*, who, in every dry season, is to furnish me with the best rain-water from Paris, and now and then with some Dresden-china cows, who are to figure like wooden classics in a library,—so I shall grow a shepherd as any swain in the Astræa."

Again, in a letter dated June 8th, 1747, addressed to the Hon. H. S. Conway ("Letters," vol. ii., p. 86), Walpole says:—

"You perceive by my date that I have got into a new camp, and have left my tub at Windsor. It is a little plaything house that I got out of Mrs. Chevenix's shop, and is the prettiest bauble you ever saw. It is set in enamelled meadows with filigree hedges.

'A small Euphrates through the piece s roll'd,
And little finches wave their wings of gold.'

Two delightful roads, that you will call dusty, supply me continually with coaches and chaises; barges, as solemn as Barons of the Exchequer, move under my window; Richmond Hill and the Ham Walks bound my prospect, but, thank God! the Thames is between me and the Duchess of Queensberry. Dowagers as plenty as flounders inhabit it all round, and Pope's ghost is just now under my window by a most poetical moonlight."

Writing to George Montague, under date May 11, 1760, Walpole says:—

"Strawberry has been in great glory; I have given a *festino* that will almost mortgage it. Last Tuesday all France dined there: Monsieur and Madame du Châtelet, the Duc de Laincourt, three more French ladies whose names you will find in the enclosed paper, eight other Frenchmen, the Spanish and Portuguese ministers, the Holdernesses, the Fitzroys,—in short, we were four and twenty. They arrived at two. At the gates of the Castle I received them, dressed in the cravat of Gibbons's carving, and a pair of gloves embroidered up to the elbows, that belonged to James I. The French servants stared, and firmly believed this was the dress of English country gentlemen. After taking a survey of the apartments, we went to the Printing House,* where I had prepared the enclosed verses, with translations by Monsieur de Lille, one of the company. The moment they were printed off I gave a private signal, and French horns and clarionets accompanied this compliment. We then went to see Pope's Grotto and the garden, and returned to a magnificent dinner in the refectory. In the evening we walked, had tea, coffee, and lemonade in the Gallery, which was illuminated with a thousand candles,—or thirty, I forget which,—and played at whist and loo till midnight. Then there was a cold supper, and at one the company returned to town, saluted by fifty nightingales, who, as tenants of the manor, came to do honour to their lord."

Mrs. Chevenix's house, Mr. Adams proceeded to say, was little more than a cottage, and the grounds were very limited. In 1750 Walpole determined "to build a Gothic castle at Strawberry Hill," and asked Sir Horace Mann to pick him up "any fragments of old painted glass, arms,—anything,—if there are such things to be found amongst the old châteaux of Italy." The picturesque and straggling character of the house is due to the fact that the work was carried on piecemeal, it being its author's most serious occupation, and he set about the erection in a most systematic manner. He was his own architect, Bentley acting as his draughtsman.† Before commencing he visited cathedrals, castles, manor-houses, and colleges, and copied all and every feature which seemed to afford any pattern for any portion of his new home. Groined roofs, cloisters, screens, tombs, windows, doorways,—anything,—was borrowed from Westminster, Durham, St. Alban's, Lincoln, Salisbury, Winchester, Oxford, or Cambridge, to be repeated at Strawberry Hill. The picture-gallery, for instance, has a ceiling copied in an elegant way from Henry VII.'s Chapel at Westminster,‡ the detail on the scale here applied being well suited for plaster. The north door of St. Alban's Abbey afforded a model for the entrance to this apartment, while Archbishop Bourchier's tomb at Canterbury was imitated, after an adapted fashion, for the rich decoration on one side of this room,—Walpole's *chef d'œuvre*. His garden-gate piers were taken from those in the choir of Ely Cathedral; and Bishop Dudley's tomb, to take another instance, furnished Walpole with an idea for the chimneypiece in the north bed-chamber,—now a sitting-room. He also was in several instances guilty, it was said, of bodily appropriating fragments of any original old building, so that the jewels of ancient Gothic work might be set in his toy building, but Mr. Adams said he had been unable to discover any of these in the building as it exists at present.

The house was originally entered from the road, but is now set back owing to the road being extended beyond, and a new entrance has been added. The west wing is where Walpole set up his printing-press, and this is a battlemented building lighted by square windows divided by modern casement-frames, with imitation Tudor drip-stones over. Mrs. Chevenix's cottage forms the oldest part, and is that portion situated nearest the Thames. This has two fronts, south and west, with a semi-octagonal porch on either side; and Walpole's taste for Venetian Gothic is here displayed in the pointed windows, terminating as they do in an ogival curve. There are two stories of these windows, and no arch joints are visible, the plaster being carried to the edge of the intrados. The upper floor is lighted by quatrefoil openings, most of which are now covered by creepers, and the crowning feature consists of an embattled parapet, executed in lath and plaster, and having wooden pinnacles at the angles. A large round tower, over the Round Drawing-room, at the western end, with a stair turret, is connected to the original building by the picture gallery, which runs east and west. This room is 56 ft. long, 17 ft. high, and 13 ft. wide. The windows contained all the quarterings of the family. The carpet was made at Moorfields, and the walls lined with Walpole's best historical pictures, with rich and rare sculpture on pedestals and tables in the alcoves of the traceried open-work, and with Lady Walpole's antique china in a closet of glass. The Waldegrave beauties, forming what is probably an unrivalled collection of contemporary portraits of noble ladies, are now hung in this gallery. They are all from the brush of Mr. Sant, R.A., and include the Duchess of Sutherland, the Marchioness of Stafford, the Duchess of Westminster, the Countess of Shaftesbury, and many others. The Princess of Wales occupies the place of honour at the royal end of the gallery. The present study, at the east corner of the south front, was the Refectory, and is lighted by a bay window surmounted by a cresting of wood. Over this apartment is the Library, which is for the most part in the same condition as it was left by Horace Walpole. The books (15,000 in number) are still arranged in presses with Gothic arches of pierced work, taken from the side door-case in Dugdale's "St. Paul's"; and above, are portraits hung as Walpole is believed to have hung them. The ceiling, in very good preservation, was painted from Walpole's design, drawn out by Bentley, his draughtsman, and executed by Clermont, with all the shields, symbols, and devices described by their author with so much parental fondness. The chimney-piece is from a tomb at Westminster; and the stonework from Canterbury. The great North Bed-chamber is now a sitting-room, as already remarked, and is richly furnished. It has a cheerful outlook, but must have been a most uncomfortable room to sleep in, every inch of space being occupied with china and curiosities. The Breakfast-room, where Walpole displayed a large part of his almost world-renowned collection of miniatures,—including fine examples by Petitot, Zincke, and other masters,—was lately used as Lady Waldegrave's morning or garden room. The staircase, at the lower entrance, has been made more commodious, pictures taking the place of Walpole's collection of old arms and armour of François Premiêre date; and Noble's statue of the Countess of Waldegrave now graces the landing. Besides the rooms which have already been named may be mentioned the China Room, which contained an exceedingly varied "collection of porcelain, earthenware, glass, and enamel on copper, of various ages and countries." The gossipy way in which Walpole fondly lingers over his treasures is often very amusing, and the following may be quoted as a specimen:—

"Two Saxon tankards,—one with Chinese figures, the other with European. These tankards are extremely remarkable. Sir Robert Walpole drank ale; the Duchess of Kendall, mistress of King George the First, gave him the former. A dozen or more years afterwards, the Countess of Yarmouth, mistress of King George the Second, without having seen the other, gave him the second; and they match exactly in form and size."

The "Little Parlour," with its chimney-piece "taken from the tomb of Thomas Ruthall, Bishop of Durham, in Westminster," is over the Breakfast Room. The Yellow Bed-chamber, or "Beauty Room," may also be mentioned. This apartment contained portraits of the celebrated, if not very virtuous, beauties of the

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* Isaac Disraeli, in his "Calamities of Authors," says, speaking of Walpole:—"He raised a printing-press at his Gothic castle, by which means he rendered small editions of his works valuable from their rarity, and much talked of, because seldom seen. That this is true appears from the following extract from his unpublished correspondence with a literary friend. It alludes to his 'Anecdotes of Painting in England,' of which the first edition only consisted of 300 copies,—'Of my new fourth volume I printed 600; but as they can be had, I believe not a third part is sold. This is a very plain lesson to me, that my editions sell for their curiosity, and not for any merit in them,—and so they would if I printed 'Mother Goose's Tales,' and but a few. If I am humbled as an author, I may be vain as a printer; and when one has nothing else to be vain of, it is certainly very little worth while to be proud of that.'"

† "Bentley, the son of Dr. Bentley, who ornamented Gray's works with some extraordinary designs. Walpole, who was always proud and capricious, observes his friend Cole, broke with Bentley because he would bring his wife with him to Strawberry Hill. He then asked Bentley for all his letters back, but he would not in return give Bentley's own."—*Ibid.*

‡ Or King's College Chapel, Cambridge? Disraeli, after referring to Walpole's "literary confessions," says,—"There were times when Horace Walpole's natural taste for his studies returned with all the vigour of passion,—but his volatility and his desultory life perpetually scattered his firmest resolutions into air. This conflict appears beautifully described when the view of King's College, Cambridge, throws his mind into meditation, and the passion for study and seclusion instantly kindled his emotions, lasting, perhaps, as long as the letter which describes them occupied in writing:—'May 22, 1777. The beauty of King's College, Cambridge, now it is restored, penetrated me with a visionary longing to be a monk in it. Though my life has been passed in turbulent scenes, in pleasures or other pastimes, and in much fashionable dissipation, still, books, antiquity, and virtue kept hold of a corner of my heart; and since necessity has forced me of late years to be a man of business, my disposition tends to be a recluse for what remains,—but it will not be my lot; and though there is some excuse for the young doing what they like, I doubt an old man should do nothing but what he ought, and I hope doing one's duty is the best preparation for death. Sitting with one's arms folded to think about it is a very long way for preparing for it. If Charles V. had resolved to make some amends for his abominable ambition by doing good (his duty as a king) there would have been infinitely more merit than going to doze in a convent. One may avoid actual guilt in a sequestered life, but the virtue of it is merely negative; the innocence is beautiful."

Court of Charles II., but these were sold at the great sale. Beyond these rooms, past the staircase and the breakfast-room, was the Green Closet, which contained the greater part of the collection of old bronzes, wax models, old glass curiosities, and Venetian dram-bottles, belonging to Mrs. Kennon, the *virtuoso* midwife, together with Hogarth's portrait of Sarah Malcolm, and other similar things, over which Walpole would favour his visitors with gossip by the hour. The Blue Bed-chamber and the Red Bed-chamber contained more china. The Plaid Bed-chamber, and Walpole's own room, may be named; also the Star Chamber, with its ugly modern glass, where the bust model in stone of Henry VII., by Torrigiano, for the king's tomb at Westminster, was shown. Several interesting views of the old house are now hung in this apartment. The Holbein Chamber was so named on account of its having contained traced copies by Vertue from the Holbein originals at Buckingham House; and among many other curious fragments and singular conceits, more or less historic, kept here, was Cardinal Wolsey's hat, which at the sale was purchased by Charles Kean, the actor, for twenty guineas. The open-work screen at the entrance to this room, forming a kind of lobby, is very noticeable. The Round Drawing-room was 22 ft. in diameter, having a large bay window, enriched by the Earl of Leicester's arms, and the costly chimney-piece here is said to have been "taken from the Tomb of Edward the Confessor," and improved by Adam, the architect. It is beautifully executed in white marble, inlaid with scagliola by Richter, and this elaborate and exquisitely-finished work may still be examined and admired *in situ*. The room was hung with crimson damask of Norwich make, and contained Vandyck's celebrated portrait of Lady Dorothy Percy, Countess of Leicester, and her sister, the Lady Lucy, the famous Countess of Carlisle, for which Walpole gave only twenty-nine guineas at the Penshurst sale. It was sold at the Strawberry Hill sale for 231*l*., and now, of course, would secure a very much higher sum. The curious room known as the "Tribune" contained the larger portion of Walpole's miniatures. It is "a square recess with semicircular recesses in the middle of each side," and with a lofty domed ceiling executed in plaster. Snuff-boxes, chalices, apostle-spoons, the bell made for the Pope by Cellini for the ceremony of exorcising of caterpillars, antique lamps, seals, and trinkets, were here displayed. The "Beauclerk Closet," built in 1776, was equally well stored, and contained the drawings of Lady Diana Beauclerk for Walpole's tragedy of "The Mysterious Mother." Besides the house was the chapel, the combined production of Walpole, Bentley, and Chute, hashed up from various details copied from various cathedrals. The greatest length inside is 15 ft., including the porch, and its width is 8 ft. The plan is a quatrefoil, of which three sides are roofed in the form of groins in plaster, the fourth side being utilised as the porch. A pendant hangs from the quadrilateral space in the centre of the ceiling. Slender columns separate the sides and form recesses on the three faces. The front is said to have been copied from a tomb at Salisbury, and is executed in Portland stone in a characteristic manner, and the carving, like the rest of the work, is decidedly meritorious, considering the period of its erection, and more care seems to have been given to the style of its detail than in the house itself. The chapel will scarcely hold a dozen people. The Tea-room or cottage in the garden contained many fine old prints, and much Oriental porcelain. Walpole lived at Strawberry Hill during the summers of nearly fifty years, and he bequeathed the estate to the Hon. Mrs. Damer, who occupied the place from the year of his death, 1797, till 1811, when, after doing her best to keep up its old character, she resigned it to the Dowager Countess Waldegrave, who held the reversion; at this time everything remained as Walpole had left it. The house was soon allowed to get out of repair, and eventually was sold by George Robins, the auctioneer,—the sale occupying twenty-four days. Some years later it was rescued from the ruinous condition into which it had fallen by Frances, Countess Waldegrave, who restored the place and added a new wing, reinstating the place. The smaller rooms in the old building have in several cases been converted into bedrooms, but the reception and state apartments are still so used, and a good number of the decorations remain intact. The new west wing was added by the Countess about 1860-62, and consists of dining-room, drawing-room, and billard-room. Reynolds's celebrated group of the three Ladies Waldegrave, daughters of the second Earl, hangs in the drawing-room. It was painted for Horace Walpole, costing him 800 guineas.

The visitors accompanied Mr. Adams over the house, and had an opportunity of noticing the quaint stoves and mantelpieces, all being "after the Gothic manner" as it was understood by Walpole, and no two being alike. These, and the interesting fragments of stained glass inserted in the windows by Walpole will, we understand, "go with the house," whose future possessors will, it is to be hoped, leave them undisturbed. After spending some little time in inspecting the art-treasures of the house, the visitors proceeded to the small chapel in the grounds, as to the architecture of which the general opinion was that it was much more Gothic in feeling than a great deal of work done long subsequently to it. It is at present disused, but the external stonework appears to be well preserved. A vote of thanks having been accorded (on the motion of Mr. W. H. Atkin Berry) to Mr. Adams for acting as *cicerone*, the visitors left this old house thankful for the "happy thought" which suggested the visit.

PROPOSED NEW PUBLIC BUILDINGS AT MIDDLESBROUGH.

AT the monthly meeting of the Middlesbrough Town Council held last week, the Mayor (Alderman Archibald) presiding, Alderman Bulmer moved the adoption of the minutes of the Streets and Building Committee, which included the following:—

"That the architect to whom the first prize for the proposed public buildings has been awarded be communicated with at once, and an appointment made for him to meet the Building Committee at an early date in order to arrange terms for his carrying out the plans after making such alterations therein as may be necessary; and that the committee be authorised to obtain tenders for the work in connexion with the foundations of the buildings other than the town-hall, and submit them for confirmation by the Council. That the committee be empowered to get the quantities taken out, and appoint a clerk of works if necessary."

Mr. Bulmer stated that Mr. Waterhouse had awarded the three premiums for the best designs to "Law and Order," "Experia," and "Tees" respectively.

The Town Clerk then opened the envelopes bearing these mottoes, and found that "Law and Order" was Mr. G. G. Hoskins, Darlington; while "Experia" was Messrs. G. Nichols & Sons, Albert-buildings, Queen Victoria-street, London; and "Tees," the winner of the third premium, was Mr. Lacy W. Ridge, Woburn-place, London.

A discussion took place as to whether the names of the unsuccessful competitors should be disclosed, and it was decided that they should not be made known.

Alderman Williams was opposed to tenders being obtained until the committee had had time to consider how the work should be proceeded with. He moved that the Public Buildings Sub-Committee deal with the question fully, and report as to the best course to be pursued.

Councillor Mildred seconded this amendment, which was carried by the casting vote of the chairman.

The estimated cost of the proposed buildings is 70,000*l*.

Markets, Liverpool.—At a meeting of the Liverpool City Council on Wednesday, a recommendation was made by the Markets Committee that they be authorised to negotiate for the purchase of the site in Great Charlotte-street and Rose-street, containing about 2,284 square yards (referred to in the report of the Corporation Surveyor of March 14, 1882), for the purpose of the erection thereon of a wholesale market for the sale of fish, shellfish, and dead poultry, the consideration of which was postponed by the Council on April 5, 1882." This recommendation, which involves an outlay of 40,000*l*., was, after a great deal of discussion, eventually referred to a special committee for consideration, together with another recommendation from the Markets Committee as to the rebuilding of the south end of St. John's Market, at a cost not exceeding 7,000*l*.

PROPOSED LUNATIC ASYLUM FOR EXETER.

THE Exeter Town Council have had under consideration for some time past the advisability of erecting a lunatic asylum for the city, as the County Asylum at Exminster is not nearly large enough to receive all the city patients, and many have, therefore, to be sent to Fisherton House, Salisbury. At the last visit of the Visitors of Pauper Lunatics to Fisherton there were forty-eight male and thirty-nine female pauper lunatics confined there chargeable to the city. At length the Council determined to build an institution in or near the city, and a site was acquired at Digby's, Heavitree. Plans were then invited, and premiums offered for the best designs, as follows:—First, 100*l*.; second, 50*l*.; and four of 25*l*. each. About forty designs were sent in, from all parts of the kingdom, for competition. Professor T. Hayter Lewis was appointed to adjudicate upon them. The preliminary sketch designs were displayed in the upper room of the Victoria Hall, for the inspection of the assessor, who selected for the final competition eight plans, bearing the following mottoes, with the estimated cost then set against each of them:—"Stet," 42,000*l*.; "Nota Bene," 29,500*l*.; "Experientia," 41,500*l*.; "Cumi," 41,519*l*.; "Isca Dumnonius," 47,255*l*.; "Mens," 51,444*l*.; "Light and Shade," 31,500*l*.; and "Deo non Fortuna," 44,984*l*. The highest estimate was 80,000*l*., and the lowest 29,100*l*. The assessor fixed the 12th inst. as the last day for receiving the plans in the second competition, and he attended in Exeter on the 13th and 14th inst., to finally examine them, and make his selection for the premiums offered. We learn that he has selected those marked "Stet" for the first premium, and "Mens" for the second, and the following for the four premiums of 25*l*. each, arraying them in alphabetical order according to the mottoes, viz.,—"Deo non Fortuna," "Isca Dumnonius," "Light and Shade," and "Nota Bene." The author of the designs marked "Stet" is Mr. R. S. Wilkinson, of Furnival's Inn, Exeter and Torquay. In his plans, accommodation is provided for 300 patients, and the original estimate has been increased by 2,000*l*.; in fact, the approximate cost of nearly every design appears to have been altered since it was first submitted. The author of the second premiated design is Mr. A. W. Kershaw, of Lancaster, and his final estimate was 52,032*l*. The cost and authors of the other plans which were awarded 25*l*. each were as follow:—Messrs. Hine & Marshall, Nottingham, "Deo non Fortuna," 41,730*l*.; Mr. E. Ashworth, Exeter, "Isca Dumnonius," 55,000*l*.; Mr. R. Lysaght, Bristol, "Light and Shade," 36,044*l*.; and Mr. J. M. Pinn, Southernhay, Exeter, "Nota Bene," 29,500*l*. The authors of the two remaining designs were architects of Birmingham and Hull, and the expense of carrying out their plans was estimated at 44,000*l*. and 41,500*l*.

SALE OF A BUILDING SITE IN EASTCHEAP.

LAST week Messrs. Fox & Bousfield submitted for sale, at the Auction Mart, a freehold property, being the premises Nos. 2, 3, and 4, Cross-street, Eastcheap, containing a building area of 4,250 superficial feet. The existing buildings on the site were stated to be three stories in height, having large office and warehouse accommodation, but the premises were represented as not adequately utilising the land, which from its extent and position was one of the best undeveloped building sites in the City, the value of which would be much increased by the execution of the intended improvements by the formation of the new street and the construction of the Inner Circle Railway. The auctioneer, in offering the property, stated that land in the immediate locality was recently sold at 10*l*. per foot. The first offer for the property was 7,000*l*., and it was ultimately sold for 11,000*l*., the auctioneer observing that the purchase-money was much below its value, as 15,000*l*. had been offered and refused for it a short time ago, but that the property was now offered for absolute sale.

A Group of Ten Almshouses has been erected at Bowling, for Sir Henry W. Ripley, bart., from the designs of Mr. Jas. Ledingham, architect, Bradford.

BUILDING PATENTS.*

APPLICATIONS FOR LETTERS PATENT.

2,710. G. Anderson, Arbroath. Machines for cutting and dressing stone. June 9, 1882.

2,717. J. Casey, London. Water-closet apparatus. June 9, 1882.

2,718. T. Ogden, Burnley. Stoves and fire-places. June 9, 1882.

2,772. R. W. Hutchins, London. Machinery for making slabs of plaster, for ceilings, &c. June 13, 1882.

2,783. H. J. Haddan, London. Machinery for cutting and dressing stone. (Com. by J. P. Korschilgen, Berg, Germany.) June 13, 1882.

2,794. C. Hulseberg, London. Boilers for heating greenhouses and buildings by hot water, &c. June 14, 1882.

2,806. S. Deards, Harlow. Securing sheets of glass, &c., for roofing purposes. June 14, 1882.

2,815. A. B. Brown, Edinburgh. Ventilating, &c. June 15, 1882.

2,829. R. R. McKee, Kirkcaldy. Water supply and apparatus for flushing drains. June 15, 1882.

2,834. A. M. Clark, London. Water-closets, &c. (Com. by J. J. B. Frey, New York, U.S.A. June 15, 1882.

NOTICES TO PROCEED

have been given by the following applicants on the dates named:—

June 13, 1882.

615. J. H. Miles, Southampton. Construction of window-sash and door frames. Feb. 8, 1882.

658. A. McLean, London. Slabs or panels for decorative purposes. Feb. 10, 1882.

950. W. P. Bonwick, London. Window-fastenings, &c. Feb. 27, 1882.

2,357. T. W. W. Barrett, London. Apparatus for enabling persons to ascend to the tops of chimney-stacks, church spires, &c. May 19, 1882.

June 16, 1882.

652. J. Stainer, Heckmondwike. Apparatus for lifting stones, bricks, &c., on to scaffolding. Feb. 10, 1882.

654. T. Fraser, Aberdeen. Linings for chimneys or vent flues, &c. Feb. 10, 1882.

786. J. M. Lamb, London. Ventilators and chimney-cowls. Feb. 18, 1882.

ABRIDGMENTS OF SPECIFICATIONS.

Published during the Week ending June 17, 1882.

4,745. R. T. Gillibrand, Darwen. Apparatus for heating water, &c.

This is chiefly applicable for heating buildings, &c. A boiler containing a furnace is connected by a steam or hot-water pipe with another boiler, and a flue carries the products of combustion from the furnace to the second boiler, where the smoke, &c., is fired and consumed in the flues of this boiler. Oct. 29, 1881. Price 6d.

4,796. G. H. Jennings & S. Jennings, London. Lavatories, &c.

The tipping-basins have pivots on their sides, by which they are mounted in U-shaped recesses, and retaining flanges are fitted so that they can only be lifted out when horizontal. Nov. 2, 1881. Price 6d.

4,878. J. P. Bayly, London. Bricks.

These are made with a tenon, dovetail shape; on the bottom and on the top a recess to receive a similar tenon on the brick of the next course. (*Pro. Pro.*) Nov. 8, 1881. Price 4d.

4,927. E. de Pass, London. Manufacturing artificial stone.

The stone is made of sand, amorphous silica, quicklime, and water. These are mixed together and moulded by ramming into the required shape, and allowed to set. The blocks are then placed in tanks of water and heated up to 200 degrees Fahr., when they are ready for use. (Com. by R. H. Stone, Brighton, Victoria.) Nov. 10, 1881. Price 4d.

4,929. H. J. Haddan, London. Stoves.

The body of the stove is formed of two concentric cylindrical shells, the inner one containing the firegrate and ashpan, and the annular space between the two being filled with hot air moistened by the evaporation of water, which is placed in the base of the stove. (Com. by J. Schneur, Paris.) (*Pro. Pro.*) Nov. 10, 1881. Price 2d.

4,941. W. Cunningham, Dundee. Ventilating apparatus.

Two rotating propellers are used similar to those known as "Root's blowers." These are on parallel shafts and are driven by belting. Nov. 11, 1881. Price 8d.

4,953. H. W. Yates, Brighton. Ventilators for chimneys, &c.

The body is a cylindrical pipe. Above this is the head, which is a frustrum of a cone open at top and bottom, and raised a little above the top of the body. The bottom of the cone is larger than the body, and the top is smaller. Nov. 12, 1881. Price 4d.

4,971. C. W. Toor, Birmingham. Gas-stoves.

The body is made of terra-cotta. In the bottom of the case is the burner, and tubes of terra-cotta, open at both ends, cross the stove in an inclined plane, in which the external air is heated. Nov. 12, 1881. Price 6d.

5,003. H. Barron & H. Raimes, London. Water-closets, &c.

A cistern is fitted for the liquid disinfectant, which is delivered into the pan when the handle is lifted. A roller is fitted, round which is wound a cover for the seat, which can be used when required. Nov. 15, 1881. Price 6d.

* Compiled by Hart & Co., Patent Agents, 28, New Bridge-street, E.C.

THE MOISTENING OF AIR IN FACTORIES.

ONE of the leading organs of the textile industry on the Continent remarks that in spinning and weaving establishments (for cotton, wool, flax, &c.), it is a point of the first importance to maintain the air at a sufficiently high and uniform degree of moisture, to ensure a maximum of production of yarns or cloths of smooth and lustrous appearance, the continued influence of too dry an air being injurious to the quality and restricting the quantity of the out-turn. Many improvements have, therefore, from time to time been tried with a view of remedying the evil.

In winter a jet of fresh steam is usually sufficient, but in summer this means is only applicable to certain industries, while a considerable part of its efficacy is lost by the greater amount of ventilation necessitated by the higher temperature of the season.

Messrs. Koerting's system consists in the introduction of the air which has passed through a column, where a stream of water has been introduced by an appliance similar to a watering-pot. The degree of humidity can be regulated, and thus, it is remarked, the solution of this important question has been arrived at.

PRISONERS' EARNINGS.

IN an interesting account of Lewes Gaol, which is given in the *Sussex Advertiser*, the writer says at the close:—

The prison was originally fitted with 265 cells. Some fifteen years ago the influx of prisoners from Brighton assumed such formidable proportions that it was judged expedient to add another 132 cells, at a cost of about 12,600*l.*, raising the total cost of construction to near 70,000*l.* There are 397 cells, but as many are appropriated to special uses, 300 prisoners is considered about the complement of the establishment. At the present time the prison harbours only about 200. As in other gaols, prisoners sentenced to hard labour are allowed to improve their lot and advance into higher stages by earning "marks," up to 2,600. Insubordination or other offences will forfeit such marks. Prisoners are also allowed to earn some money, but only very little, a few pence a week, and the maximum earnings, whatever their time of detention, do not exceed 10s. The marks and pence are earned mainly by mat-making, which is a peculiar feature of the prison, an industry introduced while the gaol was still under the magistrates' control as a county prison, owing chiefly to the advocacy and personal application of Mr. B. Godlee, a resident magistrate. On a small scale it had been practised before Mr. Godlee's special efforts, but under his direction it was materially extended some fifteen years ago and developed into a, comparatively speaking, highly remunerative and useful industry. Under Government management it appears to have been pursued with rather less energy. At the present time the mat-making employs about sixty men, partly at frames, partly at looms. There is a separate gallery set apart for this work, in which the prisoners are variously employed, each in his own cell, open at the top, so as to admit of the warder's inspection from a raised platform dividing the two rows. Some prisoners are also allowed to do the twining in their own cells. The tools employed for this work are all marked, and prisoners are made responsible for what is served out to them. The mats are manufactured in considerable quantities, and in great variety; also of excellent quality. The manufacture yields a considerable profit, amounting to about 700*l.* in the past year, but to considerably more in some previous years. Considerable quantities of cocoanut fibre are required for the purpose. They are, as a rule, supplied in bales of twine, and the manufactured article is disposed of either in the neighbourhood, or else by wholesale delivery to London houses. There are undoubtedly certain drawbacks attending the introduction of a manufacturing industry within prison walls. But, on the other hand, the employment of prisoners on profitable work is generally considered not only permissible but advisible on more grounds than one. A political economist's mind rebels against the notion of so many hands being applied only to the useless labour of turning cranks or treadmills, an employment, moreover, deadening to the workman's mind, and very apt to produce stolid resentment rather than to suggest honest work out of gaol, while, on the other hand, the country is laid under heavy contributions to support these institutions. Again, no text is more persistently harped upon by volunteer-preachers than that we should endeavour in our prisons not only to punish, but to teach,—teach honest work, habituate to regular employment, occupying body and mind. For this purpose industrial work affords the best and most acceptable means. There is the bugbear of competition with tradesmen, of course. The objections raised on this score are, however, few. Lewes Gaol does not stand alone in the cultivation of useful industrial work, but ranks among the most successful of manufacturing prisons; and altogether it is rarely, if ever, visited by prison experts from our own county or abroad, but its arrangements, *régime*, and administration elicit praise as models for imitation.

ST. PETER'S HOSPITAL, HENRIETTA-STREET, COVENT-GARDEN.

THIS new hospital, intended for treatment of a special disease, is to be opened by H.R.H. Prince Leopold, on June 29th. It will contain forty beds, and large accommodation for out-patients. The total cost of the building and site will be 13,500*l.*, in addition to 1,000*l.* for furniture and fittings, of which 3,000*l.* are still required. The committee are appealing for assistance.

A FIREPROOF CEMENT.

A PERFECTLY fireproof cement, it is asserted, has been discovered in the Eifel Mountains, and has recently been analysed by the German chemist, Dr. Bischof, of Wiesbaden. According to the opinion expressed by professional men, it is the only material known to science which possesses, besides its plastic qualities, the virtue of being fireproof. Moistened with water, this cement forms into an elastic mass, which can be exposed, when dry, to great heat, without shrinking or showing any cracks. We should think this Sayn cement would be peculiarly adapted for repairing defective fire-places, cracks in retorts, &c., as mortar for fireproof buildings, and for the interior plastering of furnaces. The mode of its preparation is as follows:—The cement is to be well mixed in a dry state, a small quantity of water is added, and mixed well together. As a mortar it can be used in the ordinary way. In lining furnaces, however, care must be taken to press the cement well into the walls, so as to leave a smooth even surface, as the cement when dried by the air easily crumbles, and will not harden till effected by fire; moreover, it must not be treated roughly until it has been well burnt. The sole agent for this cement in England is Mr. Henry H. B. Sang.

CLEANING TILES.

IN reply to M. Brown, a correspondent says,—Mr. Ellacombe's hint of plain water and a flannel, very little water to be used, and the tiles wiped quite dry, will keep hall tiles, mostly yellow ones, looking fairly well; but as before adopting his suggestion (which came, by-the-bye, in answer to a question in your "valuable journal," as everybody calls it), a brush had been used to mine, they do not look so well as they would otherwise.

Another correspondent writes:—We find the best way to clean tiles is to wash them well with clean water only, and occasionally to scour them with pumice-stone powder. Avoid soap, milk, or any greasy or oily substance.

R. P.

The Metropolis Management and Building Acts Amendment Bill, promoted by the Metropolitan Board of Works, received the royal assent on Monday last, and is now, consequently, an Act of Parliament.

OBTAINING TENDERS FROM BUILDERS.

SIR,—I think your readers generally will agree with the note which you appended to the letter of your correspondent, "One who has been Duped," on the above-named subject. The answer occurs, however, that in actual business it is impossible to have all terms and conditions clearly laid down in every individual case as it arises, and for this reason it becomes necessary to rely upon general principles and established usage on some occasions. That these occasions are allowed to occur much too often may be readily admitted, but sometimes they cannot be avoided, and at other times the circumstances are so common that it is assumed that "it will be all right" without expressing the terms of the transaction beforehand.

It is necessary, therefore, to ascertain what general principles apply and what established usages prevail in each case. If these usages admit of the treatment which your correspondent has received, they ought to be altered; and if the law gives him no redress, it is a poor, weak institution. The gist of his grievance, I take it, is that he was *invited* to tender. Had the work been publicly advertised, and your correspondent responded in the usual way, if his tender was lowest, and assuming that his character as a tradesman was good, and his sureties substantial, he would have a fair claim to the work, personal predilections of the proprietor or his architect to the contrary notwithstanding; but, being specially and personally *invited* to tender, and being put to the great expense and labour of taking out quantities for and pricing a job worth 4,000*l*., it is difficult to see upon what principle or for what reason he could be thrown aside. If an architect could establish as good a claim to be appointed victor in a competition, he would think it a grievous case to lose it.

But it seems to me,—and this is the point on which I wish to hear your opinion and that of your readers,—that the clause as to the non-acceptance of "the lowest or any tender" does not apply, because the stipulation in question is made with two objects, one of which applies in this case and the other does not. The first of these objects is to enable the proprietor to withdraw from the work if the cost exceed his means or his wishes. All contractors voluntarily take the risk of this result when they send in tenders, and the power to withdraw from the work without incurring charges for estimates is, in itself, a useful privilege. But the proprietor did *not* withdraw from the work, and his reason for rejecting the lowest tender,—a rejection which places the rejected under an unfavourable imputation,—might be sought in the ability of the cautionary clause to warrant him in shunting a "shady" or a "shaky" contractor. In effect, however, the proprietor and his advisers have, by asking for the tenders, admitted the fitness of the firm to do the work. When the tenders are in, it is too late to go back from that position. If not fit, or if in any way unsuitable or disagreeable (and many contractors merit some of these descriptions), it was absurd to ask them to tender, and unjust to put them to bootless expense. My judgment, therefore, is for the plaintiff, with costs.

A COUNTRY ARCHITECT.

BUILDING CONTRACTS AND BILLS OF QUANTITIES.

HUGHES *v.* OWEN.

AN award has recently been made in the case of Hughes *v.* Owen in favour of the plaintiff, for 93*l*. odd, in addition to the sums of 800*l*. and 566*l*. paid into Court during the progress of the action, which was one brought to recover a sum of 2,895*l*., being the balance of accounts rendered for contract and extra works in connexion with alterations in and additions to a house belonging to the defendant.

The case is one of considerable interest to contractors and others, especially with regard to the accuracy of bills of quantities prepared by the architect himself, in a contract under which he is appointed sole arbitrator in a case of dispute, as well as the valuer of all extra works executed. The facts of the case are shortly as follow:—

In the month of June, 1877, the plaintiff submitted to the defendant a tender for certain work at 9,435*l*., according to quantities furnished by the defendant's architect. The proprietor having been assured by the architect that the work would not cost more than 4,000*l*., declined to proceed, and consequently the process known as "cutting down" was resorted to; the plans were altered, new quantities prepared and priced from a schedule of prices in the original contract, and eventually, in August, 1877, a contract for 4,953*l*. was entered into between the parties. By this contract the work was required to be completed on or before the 31st of January, 1878; payments, if not less than 500*l*. each, at the rate of 80 per cent. on the value of the work done, were to be made as the work proceeded, until the 20 per cent. retention money amounted to 500*l*., after which payment was to be made in full, and the balance to be paid within a month after the architect's certificate of completion. The quantities were guaranteed by the contract, but power was given to the architect to deviate from the drawings. Any additions or deductions were to be valued by him, and his decision upon the value of such additions and deductions, and also upon any questions arising under the contract, was to be final. The contract work and extra works (for which extra works alone the contractor claimed about 3,000*l*.) were completed in August, 1878. At that time 4,600*l*. had been paid on account of the original contract, and certain minor special contracts for extra works. A notable feature of the case lay in the fact that, while extra works had been completed to the extent of over 2,500*l*., the architect objected (on principle, as he said,) to make any payments on account of extra works until after his final certificate of completion, and yet he claimed to price such extra works at net contract prices. The result of this was that the retention money which, by the contract was limited to 500*l*., in fact amounted to more than 3,000*l*., the contractor having no security for the payment of this sum, and being compelled to suffer the inconvenience and loss caused by the almost indefinite postponement of payment of the balance, which should have been paid within a month after completion. On the 6th of December, 1878, the architect submitted a draft account to the contractor, asking for his remarks thereon; this amount showed a sum of 906*l*. due to the contractor for extra work, less half measurement charges. The contractor disapproved of it from beginning to end, and requested an interview with the architect, who, in reply, asked the contractor to put in writing his objections to the account. A long list of objections was sent, alleging the inaccuracy of nearly every item. The architect then submitted an amended account, some items being more, others less, than in the former one; some struck out and new ones added, but nearly every line being altered. The contractor still demurred, and the architect again amended the account for extra works under strong pressure both from the contractor and from the proprietor, and it then showed a sum of 1,613*l*. due to the plaintiff.

The referee appointed in the action has now fixed the amount at 2,617*l*., or nearly three times the amount originally assessed by the architect for extra works over and above the contract sum.

This extraordinary difference has arisen solely from the original quantities for the work contracted for being deficient and inaccurate.

BUILDING AT TOTTENHAM.

WRIGHT *v.* CHILDS.

THIS was an action for libel, heard before Mr. Justice Stephen and a common jury.

The parties are both builders, the plaintiff being the proprietor of some sixty houses on the "Marie House Estate" at Tottenham, and the defendant being chairman of the Tottenham Local Board, and owner of a great number of larger tenements in the same neighbourhood. At a meeting of the Board, held on the 8th of November, 1881, the defendant, referring to the "Marie House Estate," was reported to have said, "There were practically no roads at all, and no drains or sewers, and yet houses are occupied there." A question was then put by a member of the Board, "Do I understand you rightly that there are houses occupied, although there is no sewer provided?" The defendant replied, "Yes, that is so; and I hope the Board will insist on that estate being at once made up with kerbing and footpaths the same as other estates. Then, as to the sewers and surface drains, if there are any, they stand full of sewage; the fall is the wrong way, and sewage regurgitates up into the roads and gardens. I have the law on my side, and if the drains were opened they would be found full." These proceedings of the Board having been reported with considerable prominence by the local newspaper, the plaintiff claimed 5,000*l*. for compensation for the damage which he had suffered. The defendant, by his pleadings, denied having uttered the libellous expressions charged, and also pleaded justification and privilege.

The expressions were proved by the shorthand writer who reported the proceedings at the meeting, and the plaintiff himself was the next witness. He stated that when he bought the land in question for the purpose of building upon it, the roads, sewers, and drains had already been laid in accordance with plans which had been approved by the Local Board and under the inspection of its officers. Complaint had been made in respect of two of the plaintiff's houses, in the case of which an examination revealed that the sink pipe had been connected with the surface drains, instead of with the sewers; but this had been set right. There had been previous altercations and some litigation between the plaintiff and the defendant, and the defendant had threatened more than once to "put the Local Board on to" the plaintiff. The plaintiff further charged the defendant after the commencement of the action with having procured persons to stop both the surface drainage and sewage pipes. He said that those pipes had in more than one place been deliberately broken upon his property, and plugs of clay and matting inserted, so as to choke the pipes, with a view to making evidence for the trial of this action, the places where these plugs had been inserted having been covered again with earth, so as to conceal what had been done. He further added that he himself had seen the defendant jumping on the pipes and picking out the clay from the joinings.

The Surveyor to the Local Board, and other persons, members of it, were called as witnesses on behalf of the plaintiff to speak to the condition of the drains and sewers upon the property in question, and one witness stated that eight or nine cartloads of sewage had been removed from the surface-drains in St. Paul's-road on the defendant's property. It was denied, however, by the plaintiff's witnesses that this sewage had found its way from the plaintiff's houses.

The defendant, being called, stated that in 1875 he had bought part of a property known as the Coleraine Estate, and expended about 100,000*l*. in building upon it. The Marie House Estate, which adjoined, was purchased by a Mr. Hine in 1878 and laid out for building. The plaintiff was only one out of more than thirty proprietors upon that estate, the condition of which caused much injury to his own. The defendant contradicted the evidence of the plaintiff as to his having procured the secret stoppage of sewers or drains upon the plaintiff's property.

Other witnesses were called on behalf of the defence to describe the condition of the Marie House Estate in respect of sewage and drainage, and deposed to the faulty arrangement of the pipes, which in one place were laid in a form known to surveyors as a "hog's back," which necessarily produces at least a partial stoppage owing to the lodgment of sewage or drainage matter.

The jury, before the case concluded, intimated that they were agreed to find a verdict for the defendant.

Judgment was given accordingly.

STAINED GLASS.

Hayton.—The west window of St. Mary's Church, Hayton, near Maryport, has just been filled with a memorial window, erected by Mr. Joseph Hetherington, of Midtown. The window contains four lights; the two centre openings, divided by a narrow mullion, being filled with one subject running through the two, that of "Christ blessing little children." In the one compartment, the Saviour is resting his hand lightly upon the head of a little child, whilst around him are grouped little ones with flowers, wreaths, &c. In the other compartment are shown mothers bringing their children, whilst in the background are the disciples, who have ceased rebuking them. The bases of these lights contain the subject (crowned by dwarf canopies) of Mary washing the feet of Jesus in the house of Simon the Pharisee. The lights are surmounted by canopy work turreted and foliated. The side lights respectively are filled with single figures of "Our Lord as the Good Shepherd" carrying a lamb in his arms, and "Our Lord as the Light of the World," representing Him knocking at a disused and choked-up door, typical of the human heart choked up with long-neglected devotion and want of faith. Angels at the bases bear scrolls with the single word "Alleluia." At the foot of the window is a dedicatory inscription to the memory of the wife and children of Mr. Hetherington. The window is from the studio of Messrs. Gibbs & Howard, of Charlotte-street, Fitzroy-square.

Haworth (*Yorkshire*).—The first of the aisle windows of the new Parish Church has just been filled with stained glass at the cost of Mrs. Eliza Anderton, of Bradford, as a memorial of her deceased parents, Mr. Wm. and Mrs. Mary Ann Townend, of Cullingworth. The window is of three lights, and of fifteenth-century character. The subjects illustrated are the Annunciation; the angelic declaration to the shepherds of the birth of the infant Saviour; and the wise men from the East following the guiding star to Bethlehem. In the tracery lights are a choir of angels, some with harps, &c. The groups are relieved in the main from a white or grisaille ground; the grounds of the tracery lights and of some adjacent parts being ruby (diapered) and blue, the effect of each light being further enhanced by rich ornamental *bordures*. The window is from the studio of Messrs. Powell Bros., Leeds.

Ledbury.—In the Webb Memorial Window, recently completed for Ledbury Church, the First and Second Advent of Our Lord are shown together. The first coming is heralded by the preaching of St. John the Baptist, "Prepare ye

the way of the Lord." This is the first subject at the bottom of the window on the left hand. The second subject is the Archangel Gabriel announcing to the Blessed Virgin Mary that she is to be the mother of the Saviour, and that He should be born of her. The third subject shows Our Lord's Birth or first coming. Above is illustrated the second coming. In the top of the window Our Lord is shown coming surrounded by seraphim; below are shown His Mother who bore him, as Mercy; behind her is the Lily. On the other side is St. John the Baptist, as Justice, with the sword,—she the preacher of Purity, he of Repentance. In the centre is Our Lord's Cross (the sign of the Son of Man) borne by angels, whilst beneath is St. Michael with the balance, and the angels with the last trumpets. Standing on the earth, which this heavenly host is about to visit, are Enoch and Elias witnessing to the world the truth of Holy Prophecy. The window is from the studio of Messrs. Lavers, Westlake, & Co., Endell-street.

THE BLACKSMITH'S ART.

MESSRS. GARDNER have undertaken the onerous task of forming a collection illustrative of the blacksmith's art in the past, and a meeting in connexion with their exhibition will be held by the Architectural Association on Saturday, July 1st, when a paper by Mr. G. H. Birch, secretary of the London and Middlesex Archæological Society, will be read.

When we reflect that nearly all existing specimens of the blacksmith's art, as distinguished from the locksmith's and armourer's, are permanently fixed to wood, brick, or stone, and are therefore not available for exhibition, we easily realise that the difficulties in getting together anything like a representative collection must be considerable. Nevertheless, good examples of Flemish, German, and Italian, as well as English wrought iron, will be found, many of them being unique in their methods of treatment. Prominent among the objects brought together are several muniment-chests, one contributed by Messrs. Marks & Durlacher being especially fine. Other specimens worthy of remark are window-grilles, steel-yards, brackets, some valuable door-knockers and hinges. It is well known that for a long while Mr. Ruskin has been earnestly advocating the more general use of wrought iron for domestic purposes, and we hail with satisfaction every effort towards a realisation of his aspirations in this direction. The exhibition will be held at 453, Strand, and remain open from June 27th to July 7th inclusive, and admission will be given to architects and professional men on production of their cards. Application for admission by the public must be made to Mr. E. or Mr. J. Gardner, at 112, St. Martin's-lane.

"WASHABLE WALLS."

SIR,—I saw some remarks on this question in your journal some months ago, and I carried out the instructions, as I wanted some washable paint for the walls of a cottage hospital.

The result has proved satisfactory, and I can recommend the "Astbury" process to your correspondent. M. D.

SIR,—In your last issue I find "W. H. S. S." is anxious to know of an "inexpensive washable decoration (not paper) for walls of institutions such as hospitals."

I would most certainly advise "W. H. S. S." to try "Lincrusta-Walton, the Sunbury wall decoration, which is not only washable, but is almost indestructible, besides which it is a most perfect decoration.

It does not come quite as cheap as "W. H. S. S." requires, but its durability, and the easy way in which it can be cleaned, makes it in the end cheaper than the commonest of wall papers.

GEORGE MASON.

New Waterworks, Henley-on-Thames.—On Saturday last a party of noblemen and gentlemen, comprising many well-known engineers and scientific authorities, assembled at Henley-on-Thames, on the occasion of the opening, by the Right Hon. W. H. Smith, M.P., of the new waterworks recently completed for the supply of the town. The works, which have been designed by Mr. Jabez Church, C.E., are fitted with the Atkins patent system of softening and purifying water in large quantities, and are the first example of the application of the invention on a scale large enough for public water supply.

EXPLOSION WITH ELECTRIC LIGHTS.

IN Pesth, as in all the chief cities of Europe, experiments are being carried on just now with various systems of electric lighting. At the National Theatre in the Hungarian capital, where the Swan system was being tried, an alarming break-down occurred on the second night of the experiment. The opera of "The Marriage of Figaro" was announced, and a numerous audience had assembled. In the course of the first act the electric lamps suddenly exploded, and the entire apparatus broke down. The conducting wires became white hot, while the lights were completely extinguished. The performance, of course, was stopped, and the audience was for the moment seized with panic and left their seats. Fortunately there was no serious accident, and half an hour afterwards the performance was resumed with the help of ordinary gas lights. The cause of the breakdown has not yet been explained.

PAVING APPORTIONMENTS.

ALLUM *v.* DICKINSON.

THIS case came up in the Court of Appeal (from a decision of the Queen's Bench Division) on Tuesday, before the Master of the Rolls, and Lords Justices Lindley and Bowen.

The case, which was one of considerable importance to owners and occupiers of house property within the metropolis, was whether the plaintiffs, as the representatives of the owner of certain house property at Highbury New Park, were entitled to recover from the defendant (who was the lessee of one of these houses for a term of seven, fourteen, or twenty-one years at a rack rent) the proportionate share of the expenses of paving the street, for which sum (as apportioned to the particular house) a demand had been made by the vestry of St. Mary, Islington, upon the plaintiffs, as owners, and by them paid in pursuance of notice from the vestry clerk of the parish. The lease to the defendant (the tenant) contained a covenant that he would pay the yearly rent, "and also will pay the sewer and main drainage rates, tithe-rent charges, Board of Health, metropolitan, and other district rates and assessments whatsoever, whether Parliamentary, parochial, or otherwise, which now are or which at any time during the said term shall be taxed, rated, charged, assessed, or imposed upon the said demised premises or any part thereof, or upon or payable by the occupier or tenant in respect thereof (except the property or income tax)."

Upon the hearing of the special case in the Queen's Bench Division, in February last, judgment was given for the defendant by Mr. Justice Mathew and Mr. Justice Cave, upon the ground that the amount sued for was not a "sewer or main drainage rate," &c., or "assessment Parliamentary, &c., charged either upon the premises or upon the tenant or occupier in respect thereof," within the terms of the lessee's covenant; their Lordships observing that the charge in question was one which was made once for all, and was clearly for works for the permanent improvement of the property, and, therefore, for the interest of the landlord as distinguished from a rate made for temporary or current expenditure for the interest of the tenant or occupier.

From this decision the plaintiffs, the representatives of the landlord, now appealed. The argument turned upon the construction of the provisions of the Metropolis Local Management Act, 1855 (18 & 19 Vict., c. 120), and the Amendment Act, 1862 (25 & 26 Vict., c. 102), relating to the paving of new streets and the power of Vestries or District Boards to require payment of the costs or expenses from the owner or occupier.

Their Lordships affirmed the decision of the Court below, and dismissed the appeal.

Miscellanea.

Royal School of Art-Needlework.—The annual sale of embroideries, &c., from the Royal School of Art-Needlework at South Kensington, of which her Royal Highness the Princess Christian is President, was opened on Tuesday, by permission of the Duke of Westminster, at Grosvenor House. The school was founded with the twofold object of providing suitable employment for gentlewomen and of restoring ornamental needlework to the high place it once held among decorative arts. How far it has succeeded in effecting the first object may be judged from the fact that the three workrooms, the designing-room, and other parts of the school in the Exhibition-road are daily filled with students, who find employment there; while the many admirable specimens of art-needlework at Grosvenor House show to what good purpose the art of design, the employment of colour, and the use of the needle have been taught.

Safety in Metropolitan Theatres.—At the meeting of the Metropolitan Board of Works on the 16th inst., it was resolved, on the recommendation of the Fire Brigade Committee, that the chief officer's report on the theatres in the metropolis which are now under inspection, and which he has not yet reported upon, be printed as soon as it is ready. The Building Act Committee reported, with reference to the notice of appeal of Mr. A. W. Arnold, the owner of the Lyceum Theatre, against the requisitions of the Board as to the structural alterations of the theatre, that the committee, in exercise of the authority conferred on them by the resolution of the Board of the 26th of May, have instructed the solicitor to retain such counsel as he thinks necessary to represent the Board at the arbitration, and also to retain Mr. John Whichcord and Mr. Henry Currey to give evidence in support of the requirements of the Board; also recommending that Mr. W. Hudson, in reply to his letter submitting certain observations by the owner of the Lyceum Theatre upon the requirements of the Board, and an alternative plan for the reconstruction of the gallery stairs, be informed that the Board are unable to recede from, or vary, any of the requirements contained in their notice. This was agreed to, notwithstanding a protest from Mr. Reddish that as there had been no accident of any kind in this theatre, the action of the Board was somewhat arbitrary, and would tell very heavily on the owner. He thought a comparison should be made between the theatres and some of the large hotels and shops, where hundreds of persons lived.

Proposed Improvements in the Strand.—On the 16th inst. a meeting was held at Carr's Hotel, Strand, under the auspices of the Strand Improvement Association, for the purpose of agreeing to a memorial to be presented to the First Commissioner of Works in reference to improving the access to the New Law Courts, the removal of the south side of Holywell-street, and the widening of the Strand. The Rev. J. Lindsay, rector of St. Clement Danes, presided. A memorial, which it was proposed to present to the Right Hon. G. J. Shaw-Lefevre, was read, which called his attention to the growing necessity of improving the access to the New Law Courts from the west and north-west. The memorialists asked, in view of the opening of the Law Courts, that the First Commissioner of Works would take the whole question into his consideration. The rev. chairman remarked that upon moral grounds the accomplishment of the suggested improvements was very desirable. Mr. F. H. Fowler, of the Metropolitan Board of Works, moved the adoption of the memorial, and that the members for Westminster be requested to introduce a deputation from the Strand Improvement Association to the First Commissioner of Works in order that they may personally present the petition to the right hon. gentleman. Mr. Innes seconded the motion.

Toxteth Park.—Colonel Wilson presided at the last monthly meeting of the Local Board for the district of Toxteth Park. The death-rate for the month was 15·3 per 1,000 per annum, and the medical officer (Dr. M'Lelland) reported that no deaths had occurred during the month from zymotic disease, and the district continued in an extremely satisfactory condition. Mr. Hall, the surveyor to the Board, in his annual report, said plans of 239 dwellings, comprising mansions, villas, shops, and cottages, were submitted during the year, as compared with 213 the previous year, and that year was very much in excess of any previous year. There were erected thirteen villas, varying from 150*l.* to 300*l.* annual value, or an average of 225; sixteen at an average of 100*l.* per annum; sixty-five varying from 30*l.* to 50*l.*; and 145 from 16*l.* to 20*l.* and 30*l.* The net annual value now amounts to 103,619*l.*, as compared with 97,737*l.* last year, or an increase of 5,882*l.*, being the largest increase for one year that has ever occurred in this district. There are at the present time about 278 houses of all classes unoccupied, and 110 in course of erection.

City of London College.—The *City Press* states that the Directors of the Bank of England have voted a contribution of 500*l.* towards the fund for the new buildings of the City of London College.

Delayed in the Press.—In consequence of the New Amendment Act having become law, the publication of Mr. Banister Fletcher's new text-book, "The Metropolitan Building Acts," is temporarily delayed.

Stafford House.—Stafford House was on Friday night, 16th inst., lighted by electricity, the incandescent system being used throughout. The experiments were carried out by the British Electric Light Company, and the Duke of Sutherland invited a large number of gentlemen to witness them. The lighting commenced at ten o'clock, and was continued till after midnight. The total number of lamps in use was 258, each of 20-candle power. The picture gallery, which is 123 ft. in length, was lighted by 176 lamps, and in the banqueting-room, which is 62 ft. long, there were seventy-three lamps. The machinery by which the lights were sustained was erected temporarily in the garden, and driven by a steam-engine of twenty horse-power. The whole of the work was prepared in five weeks. There were six Gramme dynamo-machines, with two feeders. The engineer of the company explained that the engines were not worked up to their full power, and that in the event of two of them breaking down, by working the remaining four up to their power no inconvenience would be caused. The machinery worked with perfect facility. It was shown that there was no danger by coming into contact with the wires, and that the lamps could be separately or collectively extinguished or removed at will.

The Vyrnwy Waterworks: the Contracts for Iron Pipes.—At a meeting of the Liverpool City Council on Wednesday last, Mr. Bower moved the following recommendation of the Water Committee:—"That the tender of Messrs. Cochrane & Co., to supply iron pipes (contract No. 14) for the new works between Old Marton and Malpas, at the prices specified in the schedule to their tender, be accepted, subject to the execution of a contract satisfactory to the Corporation." Mr. Bower said it was very satisfactory that this was the lowest tender, because Messrs. Cochrane were supplying them with particularly good pipes. The Deputy-Mayor.—What is the amount involved? The Town Clerk.—It is about 100,000*l*. Mr. Bower.—The amount involved is a large sum; it is 20,000 tons of pipes at 4*l*. 7*s*. a ton. Alderman Rigby seconded the motion. Mr. Hughes moved an amendment that the matter be referred back to the committee, on the ground of alleged favouritism towards Messrs. Cochrane, but after a great deal of discussion, the amendment was withdrawn and the tender was accepted.

Ornamental Burial Grounds.—This week an application was made to Dr. Tristram, Q.C., Chancellor of London, sitting at St. Paul's Cathedral, for a faculty or licence to convert the old disused burial-ground of St. John the Evangelist, Westminster, into an ornamental garden for the recreation of the inhabitants, numbering some 30,000, of whom 5,000 were school-children. Mr. Brunskill appeared for the Ven. Dr. Jennings and others, in support of the application, and informed the court that a site for a mortuary had been selected at the Stoneyard, Horseferry-road, and the burial-ground was to be converted into a flower-garden. Mr. Wright, the secretary of the Garden Committee, attended the court, and the matter was discussed. The original application was made some time back, and the Duke of Westminster was one of the parties. Mr. Brunskill now mentioned that the Duke of Westminster had contributed 500*l*., and the petitioners would bear the rest of the expenses. The Chancellor said he had no hesitation in granting a faculty.

Wasted Gas from Blast Furnaces.—According to the *Darlington and Stockton Times*, Mr. J. E. Stead, F.C.S., the borough analyst of Middlesbrough, has devised an apparatus for testing blast-furnace gases, which he exhibited and explained at the last meeting of the session of the Cleveland Institution of Engineers. He stated that the heating value of gas weighing nearly 7 tons, which passed off from a Cleveland furnace during the production of 1 ton of pig iron, was equal to that furnished by burning 11½ cwts. of coal, and various tests he had made had shown him that one-third of the blast-furnace gases passed unconsumed into the air, which was equivalent to throwing away about 70 tons of coal per week for every furnace making 400 tons of iron.

Proposed International Exhibition at Rome.—A Reuter's telegram from Rome, dated June 20, says that a Bill, supported by Signor Seismit-Doda and fifty deputies, for the International Exhibition in Rome in 1887, has been brought forward in the Chamber of Deputies.

Ancient Tablets from Zirgul, near Babylon.—The trustees of the British Museum have just acquired, by purchase, about 300 tablets and inscriptions from Babylonia, and chiefly from Tel-Loh, the Zirgul of antiquity. The tablets are for the most part of unbaked clay, and are principally of that order the frequent occurrence of which has led them to be not unfairly described as "usual," being employed for the setting forth of contracts, for the acquisition and alienation of lands and other commodities, astronomical and mathematical calculations, omens, and other matters referring to the life, the worship, or the science of the country. Consequently, not much new light on any question of doubt or importance is to be derived from the collection in general. But (says the *Times*) there are a few exceptions of a vivid and particular interest. A limestone cylinder, for instance, in a beautiful state of preservation and exactness of literal definition, about 6 in. long and the same in circumference, contains an Akkadian inscription of Ared-Ea, son of Kudur-Mabuk, King of Babylonia about 1300 B.C., showing that it is a dedication to the goddess Ishtar, as a thank-offering for the preservation of his life, along with that of his father, from some common danger, whether of battle or other violence, of accident or disease. There are also four cones, about 7 in. in height and 7 in. in circumference at the base, which challenge a special attention. One of these, which may be taken to exemplify the rest, carries a dedication to the god Ningirsu or Ninip, a deity of somewhat convertible or incompletely ascertained attributes, figuring sometimes as the god of war, and relegating Nergal to the divine patronage of the chase, and at other times as the god of hunting, leaving Nergal to pose as the Mars of the Babylonian mythology. The prize of the collection, however, is an unbaked clay tablet, a copy of the original document from which the celebrated Synchronous History of Assyria and Babylonia was made, and dating from about the time of Cyrus, 538 B.C. This tablet contains the History of Babylon in a fragmentary condition, from about the fourteenth to the ninth century before Christ.

The Baddesley Colliery Accident.—We have pleasure in recording the following instance of liberality. It will be remembered that on the 2nd of May last an explosion took place at the Baddesley Colliery, in Warwickshire, by which several miners were entombed. A party of volunteers was organised to endeavour to rescue them, headed by the agent of the colliery, Mr. J. Pogmore. Unfortunately, a second explosion followed, by which Mr. Pogmore and several other gentlemen were so severely burned that they died from the injuries received. Mr. Pogmore held a policy against accidents with the Railway Passengers' Assurance Company, but, not thinking that he ran any risk underground, he had preferred to pay only the ordinary rate of premium, on condition that that special risk should be excluded, and under this condition his family had therefore no legal claim. But as he met his death in an heroic attempt to save the lives of others, and the company have always recognised that under such circumstances their clients are entitled to special consideration, the directors agreed to hold the policy good for the amount which the premium actually paid would have secured had it covered the professional risk, and they presented the widow with the sum of 500*l*.

Street Improvement, Newcastle-on-Tyne.—At a recent meeting of the Newcastle Town Council, the Town Improvement Committee recommended that an alteration be made in the new street to the Quayside. By the original plans, they said, traffic on reaching the Jubilee School would have to descend by an incline of 1 in 11½ to the level of the Milk-market, thus losing 20 ft. of level, and to ascend again by an incline of 1 in 21 to the level of the New-road at the Sally-port. The committee had prepared plans showing a high-level road, leaving the New-road at the east end of the Keelman's Hospital, and which would skirt the new street at a higher level, passing the site of Vint's-buildings, taking up Causey-bank at its present level, and rejoining the new street near the Sally-port, thus forming a practically level road between the two points, and entirely avoiding the descent into the Milk-market. The net cost of the improvement would be about 2,300*l*., exclusive of the value of Vint's-buildings. The report was adopted.

Wisbech Exhibition.—Messrs. Leach & Sons' exhibition of paintings on china, terra cotta, &c., which has been held at the Working Men's Institute, has proved a great success. The judges have made their awards of medals and other prizes, and have published their report. They draw special attention in it to the exhibits sent on loan by the Torquay Terra Cotta Company, Limited, of Hele Cross, Torquay, as well worthy of the attention of amateurs who are striving to excel in pottery decoration. This company devotes both capital and art knowledge to make the ware stand unrivalled for decorative purposes, for the use of amateurs. Another special feature of the exhibition mentioned as giving a lesson to this district, is the collection of pottery from the village of Linthorpe, near Middlesbrough. The unrivalled natural beauty of its brilliant glaze will commend the ware to all lovers of art pottery, and only need to be widely known to be thoroughly appreciated. Bricks, tiles, and all building articles are being made from this clay. The judges say, "If we in this district could take advantage of the idea and utilise the clays round Wisbech, which are so superior in texture and adaptability to the Linthorpe clays, what a field of prosperity it would open,—the old town would again have a staple article of commerce, and any success would in a great measure be indebted to your zeal in promoting art exhibitions."

Vibration from Railway Trains.—A London correspondent, *apropos* of the Duke of Westminster's complaint under this head, writes:—"The question of vibration from railway trains may become very interesting from a lawyer's point of view. The purchaser of an undermined house, with a railway running under it, is certainly a purchaser with notice of a terrible nuisance. But if the resources of civilisation are to bring in an entirely new and hitherto unsuspected trouble and danger, is there to be no compensation for their injury? The main difficulty lies in this, that those who suffer from the application of the continuous brake suffer not intermittently, but perpetually. Theirs are the houses which have the bad fortune (or, as their owners thought some years ago, the good fortune) to be very near the stations. The result is that every train,—not merely an occasional one,—enters that special tunnel clogged by the brake. It is not that the occupier suffers now and then; he suffers in some cases every three minutes, from six in the morning till midnight. The walls are cracked; the ceilings tumble down, and he lives, not metaphorically but actually, in conditions of perpetual earthquake. But suppose an Act of Parliament orders the use of that special brake, the railway companies have no option but to obey. Has the poor householder any power to obtain compensation? Apparently none." We some two or three years ago called attention to the subject.

The English Timber Trade.—The trade in home-grown timber cannot be said to be in a prosperous condition at the present time. From no part of the country can we hear of a brisk demand. In the districts round Berkshire and Buckinghamshire oak is very low in price; in the eastern counties the market is said to be overstocked, whilst in Yorkshire it is reported to be quite a drug. At the Lancashire bobbin mills trade is dull and has been for months past, and the raw material is fetching low prices. The great and prolonged stagnation in the general trade of the country of a few years back, and especially the depression in the coal and iron industries, brought prices down to the very lowest ebb. The hopes cherished that the revival of trade which set in last year would stimulate the demand and lead to improvement in values have been dissipated by the fearful havoc wrought in our woodlands and forests by the late October and April gales, which have thrust an enormous quantity of wood on an already overstocked market.—*Timber Trades Journal.*

Royal Cambrian Academy of Arts.—Efforts are being made to obtain a permanent home for this institution, and subscriptions have been received from Lord Windsor, Lord Penrhyn, and other noblemen connected with the Principality towards the building fund. The inaugural exhibition will be formally opened this month at Llandudno.

Brompton Hospital for Consumption.—Referring to our notice of the new buildings, we may add that Mr. Julius Sax was the contractor for the telephones, electric bells, and speaking tubes.

Artisans and Labourers' Dwellings.—The Select Committee of the House of Commons on this subject met on Monday afternoon and agreed upon their report, which contains various recommendations as to how the expense, delay, and difficulty of carrying out the Acts upon the subject may be reduced. The committee have been occupied for two sessions in considering Mr. M'Cullagh Torrens's Act of 1868, amended in 1879, and Sir Richard Cross's Act of 1875, also amended in 1879, as well as the Sanitary Acts and those enabling the Metropolitan Board of Works to carry out street improvements. As the result of their deliberations the committee now make a variety of suggestions with a view to abate the enormous expense which has hitherto been the chief difficulty in erecting cheap dwellings for artisans upon the remainder of cleared areas on valuable urban sites. In addition to the proposals for facilitating the operation of the Acts by removing technical difficulties and modifying the requirements of past legislation, the committee find that when Sir R. Cross's Act came into force the Vestries expected, although erroneously, that what they were doing under the Act of Mr. Torrens would be done for them by the Metropolitan Board of Works. This to a large extent stopped their work, and it became necessary to define clearly the proper sphere of the two systems. So far from dealing with them as antagonistic, the committee strongly express the opinion that both should be worked *pari passu*, each being suited to different conditions, and both being more than needed to afford any effectual relief. The committee also recommend that the obligation placed upon the Eastern Counties system of railways out of London to provide trains for artisans at the rate of 1d. for each passenger per course of seven or eight miles should be extended to other suburban railways as opportunities may offer.—*Times*.

Strikes and Strikers in the United States.—We learn from America that twenty thousand iron strikers, with members of other trades, walked in procession at Pittsburg last Saturday afternoon. Six thousand iron workers from the outside of Pittsburg, 5,000 colliers, and 8,000 Pittsburg ironworkers formed the chief divisions of the procession. All these men, we are told, showed a stubborn determination to maintain the strike. The Cleveland Rolling Mills report that the full complement of non-strikers,—1,200 men,—are now working at the old wages. All fears of disturbances are over. This ends the strike there. Many of the Cleveland strikers have gone elsewhere seeking work. The freight handlers' strike at New York has extended to 200 at the Erie Docks, and 75 at the Pennsylvania Docks. Others were solicited to join, but they continued to work at the old wages, awaiting an answer to the request sent to the head officer of each railway for more pay. The strikers made a parade along West-street, New York, endeavouring to get the men at the docks to join them. The police, however, soon dispersed them; but much disaffection has been caused among the railway dock labourers. The Hudson River Railway labourers' strike continues, almost stopping work at some of the New York City freight stations. On Saturday night the strikers held a crowded meeting, principally consisting of Irishmen, demanding 20 cents per hour. They are particularly opposed to the Italians, saying that it takes three Italians to do one Irishman's work. Several minor strikes prevail at New York, and an unsettled condition of the labour market exists in almost every trade.

Surveyorship to the City Commission of Lieutenancy.—On Monday, at a meeting of the Commission, held at the Mansion House, at which the Lord Mayor presided, Mr. Alexander Peebles, C.C., was elected to the office of architect and surveyor by a large majority. The other candidates were Mr. Arthur Hudson and Mr. H. H. Collins.

The Crusaders' Lodge of Freemasons purpose presenting two large painted windows to the Church of St. James, Clerkenwell, which is about to be restored under the superintendence of Mr. A. W. Blomfield. The windows will contain subjects from the Old Testament emblematical of Freemasonry. Mr. Charles Evans, of Warwick-street, Regent-street, is the artist commissioned to execute the work.

The Proposed New Public Offices.—The Public Offices Committee held a meeting on the 16th inst., when they unanimously approved of the preamble of Mr. Shaw-Lefevre's Bill.

Proposed Riverside Fish Market, Shadwell.—On Tuesday the Committee of the House of Lords (the Duke of Leinster, chairman) passed the private Bill promoted by Messrs. Hewett to establish a new riverside fish market at Shadwell. The Committee, however, adopted two important clauses in the interest of the Corporation of London. One of these clauses empowers the Corporation within six months after the passing of the Bill to acquire the rights of the promoters with regard to the new market on paying them their costs of promotion. The other clause provides that, if this option be not exercised, the proprietors of the new market shall compensate the Corporation for any falling-off caused thereby in the tolls at Billingsgate.

Lee (Kent).—Plans for a new Bible Christian Chapel have been prepared, and tenders will shortly be sent in for the erection of the same, which is in the Gothic style. The entrances for ingress and egress will be spacious. The front will be faced with Kentish rag and Bath stone (the sides being hidden by adjoining buildings, will be brick), and have a large five-light traceried window, the left angle having a spire which terminates octagonally, and which will be executed in Bath stone. The roof will be open-timbered. The cost will be fully 3,000*l.*, and the architect is Mr. W. Theobalds, Watling-street, City.

Lowestoft Improvement Commissioners.—The main intercepting sewer, forming part of the new general drainage scheme for Lowestoft, has recently been completed, from plans and under the superintendence of Mr. R. H. Inch, Assoc. M. Inst. C.E., Town Surveyor. Messrs. Cook, Bennett, & Thew were the contractors, the amount of the contract being nearly 9,000*l.*

TENDERS

For making new road from South-street to Malva-road, Wandsworth, for Major J. Childs. Mr. George Edwards, surveyor:—

Pizzey	£899 0 0
Killingback	899 0 0
Green	885 0 0
Mears	705 0 0
Ford & Everett	694 0 0
Nowell & Robson (accepted)	670 0 0

For repairs to The Chestnuts, Denmark-hill, for Mr. A. Stedall. Mr. George Edwards, architect:—

Homann & Son	£1,390 0 0
Simpson & Sons	1,270 0 0
Canning & Mullins	969 0 0
McLachlan & Sons	924 0 0
Martin, Wells, & Co.	915 0 0
Tarrant & Sons	902 0 0
Clark & Mannooch	881 0 0
Goad	884 0 0
Stimpson & Co. (accepted)	843 0 0

For workshops and offices in Westgate-street and store-sheds at Docks, Cardiff, for the Cardiff corporation:—

Workshops and Offices.	
C. Griffiths	£342 10 0
D. Davies	285 0 0
S. Shepton	273 0 0
J. Thomas	271 0 0
C. C. Dunn	265 0 0
J. Jones	250 0 0
O. Purnell	245 0 0
D. J. Davies	228 0 0
Store-shed at Docks.	
D. J. Davies	80 0 0
T. Richardson	77 13 9
J. Jones	60 0 0
S. Shepton	39 10 0
O. Purnell	38 10 0
J. Thomas	38 0 0
G. Griffiths	36 18 6
D. Davies	34 0 0
C. C. Dunn	30 0 0

For repairs and alterations to premises at South Norwood, for Mr. R. Brait:—

Robert Beeton, London	£1,164 0 0

For farm-buildings, Wellingborough, for Mr. C. H. B. Whitworth. Mr. E. Sharman, architect:—

J. Underwood, accepted.

For building two villa residences, for Mr. B. Blott, on the Poplars Estate, Wellingborough. Mr. E. Sharman, architect. Quantities supplied:—

G. Hackaley	£1,365 0 0
F. Abbott	1,340 0 0
G. Henson	1,300 0 0
J. Underwood	1,300 0 0
R. Marriott	1,298 0 0
E. Brown	1,272 0 0
Farden and Rooksby	1,218 0 0
G. H. Green (accepted)	1,190 0 0

For artisans' dwellings, Cork, for the Cork Improved Dwellings Company. Mr. William H. Hill, Marlborough-street, Cork, architect:—

T. O'Flynn	£11,123 0 0
J. Delany	10,600 0 0
E. & P. O'Flynn	9,236 0 0
E. Fitzgerald	8,715 0 0

For Horsham drainage works. Messrs. Gotto & Beesley, engineers:—

Ford & Everett, Westminster (accepted).

For constructing railway, two bridges, and wharf, at Grays, Essex. Mr. J. Emblin Walker, engineer:—

Ford & Everett, Westminster (accepted).

For a block of three villa residences, at Dorking, for Mr. Joseph Clift. Messrs. Bargman & Benison, architects:—

Edser	£2,610 0 0
Macey & Sons	2,598 0 0
Kilby	2,537 0 0
Goddard & Sons	2,486 0 0
J. & J. Greenwood	2,460 0 0
Hamblin Bros.	2,440 0 0
Lynn & Dudley	2,405 0 0
Heselgrave	2,389 0 0
Beale	2,292 0 0

Accepted for Valley Sunday-schools, Manningham. Mr. James Ledingham, architect, Bradford:—

Kitchen & Co., Masonry.
Lofthouse, Joinery.
R. Hill, Plumbing.
A. Hill, Slating.
Throp, Plastering.
Swift & Co., Painting.

For new clyse and other works at the outlet of the River Brue, Highbridge, Somerset, for the Somersetshire Drainage Commissioners. Mr. Alfred Woodhouse, engineer:—

J. Neave, London	£19,998 0 0
Hill & Co., Gosport	15,150 0 0
S. Robertson, Bristol	13,400 0 0
J. J. Robson, London	12,799 0 0
J. Durnford & Son, Bristol*	12,534 0 0
J. Phillips, Plymouth	12,500 0 0
R. Escott, Bridgewater	12,476 0 0

* Accepted.

For new warehouse and stables at Croydon, for Messrs. Hammond & Hussey. Mr. R. W. Price, architect. Quantities by Mr. W. H. Barber:—

Ward	£1,753 0 0
Taylor	1,530 10 0
Maides & Harper	1,515 0 0
Marriage	1,506 10 0
White	1,497 0 0
Legg	1,429 0 0
Pearson & Myles	1,420 0 0
Smith & Son	1,394 0 0
S. Page (accepted)	1,350 0 0

For a coffee-bar in proximity to the Midland Railway Station, Wellingborough, for the Coffee House Company. Mr. W. Talbot Brown, architect:—

Farden & Rooksby	£272 0 0
Henson	250 0 0
Hudson & Stevens (accepted)	224 10 0

For alteration and additions to house and shop at Irchester, for Mr. S. Parsons. Mr. H. Sharman, architect:—

Howcutt, Wellingborough	£390 0 0
Farden & Rooksby	350 0 0
Underwood (accepted)	344 0 0
Marriott	344 0 0
West, Irchester	308 0 0

For alterations and additions to warehouses, Bankside, for Mr. Moss Isaacs. Mr. James Wear, Victoria-chambers, Westminster, architect:—

Hansel	£1,090 0 0
Greenwood	1,035 0 0
Nightingale	1,027 0 0
Toms	1,022 0 0
Hobson	963 0 0
James Holloway (accepted)	948 0 0

For building new class-rooms and repairs to Belmont Hall; also repairs to Wandsworth-road school. Mr. T. H. Vernon, Abingdon-street, Westminster, architect:—

Sawyer	£597 0 0
Newton	541 0 0
James Holloway	489 0 0

For concrete subsiding tanks, stoneware pipe-sewers, cast-iron pipes, valves, sluices, &c., at Ealing. Mr. Charles Jones, engineer. Quantities supplied:—

J. Hoare & Son	£5,749 0 0
McKenzie, Williams, & Co.	5,695 0 0
W. Crockett	5,636 0 0
Kellatt & Bentley	5,573 0 0
Mears	5,472 0 0
Nowell & Robson	5,419 0 0
H. Smith	5,300 0 0
G. Gibson	5,087 0 0
J. Strachan & Co.	4,982 0 0

For the erection of new offices, No. 5, Fen-court, Fenchurch-street, for the City of London Real Property Company. Mr. R. B. Marsh, architect. Quantities by Mr. D. Cubitt Nichols:—

Smith	£3,580 0 0
W. Brass	3,572 0 0
J. & J. Greenwood	3,560 0 0
E. Conder	3,498 0 0
W. Bangs	3,475 0 0
Ashby & Horner	3,470 0 0
E. Lawrence	3,443 0 0
Mortar	3,389 0 0
Outhwaite & Son	3,144 0 0

For alterations to offices, No. 21, Mincing-lane, and No. 36, Mark-lane, for the City of London Real Property Company. Mr. E. A. B. Crockett, architect:—

J. & J. Greenwood	£989 0 0
Outhwaite & Son	938 0 0

For the construction of 1,313 ft. lineal 9-in. stoneware pipe-sewer, together with manholes, lamp-holes, &c., in Blyth-road, Bromley, Kent, for the Bromley Local Board. Hugh S. Cregeen, surveyor:—

J. Garton	£185 10 0
J. Bentley	179 9 0
Davis & Attwood	175 0 0
W. & J. Woodham	165 0 0
J. Taylor	149 7 0
E. Peill & Sons	145 0 0
T. Lansbury (accepted)	121 0 0

For the removal of sewage-tanks, for the Bromley Local Board:—

T. Lansbury (accepted)	£85 0 0

Nicholson Institute Buildings at Leek. — In the list of tenders for these buildings, the address of the Midland Joinery Company should have been given as Sparkbrook, *not* Smethwick.

For the erection of the Birmingham and Midland Eye Hospital, Birmingham. Messrs. Payne & Talbot, Birmingham, architects. Quantities supplied by Mr. W. Wykes, Birmingham :—

Bradney & Co., Wolverhampton	£17,300 0 0
Surman & Sons, Birmingham	16,747 0 0
G. F. Smith, Milverton	16,700 0 0
T. Collins, Tewkesbury	16,600 0 0
H. Bennett, Rugby	16,525 0 0
H. Lovatt, Wolverhampton	16,230 0 0
Parnell & Son, Rugby	15,875 0 0
F. Moffatt, Birmingham	15,720 0 0
Jeffrey & Son, Birmingham	15,400 0 0
Sapcote & Sons, Birmingham	15,340 0 0
Barnsley & Sons, Birmingham	15,180 0 0
W. & J. Webb, Birmingham	15,000 0 0
J. Garlick, Birmingham	14,900 0 0
J. Bowen, Birmingham	14,789 0 0
W. T. Bennett, Birmingham	14,727 0 0
Barker & Son, Birmingham	14,686 0 0
W. Robinson, Birmingham*	14,682 0 0

* Accepted.

For the re-drainage of a portion of the Bedford Park Estate, for the Bedford Park Company (Limited). Mr. Frank Goldring, surveyor. Quantities by Mr. C. E. Lailey, Engineer to the Acton Local Board :—

Wheeler	£7,330 0 0
J. Strachan	6,625 0 0
Rowles	5,662 0 0
Pizzey	5,525 0 0
Nowell & Robson	5,330 0 0
Bloomfield	5,180 0 0
Catley	5,000 0 0
Finnegan	4,973 0 0
Mears	4,444 0 0

For building a pair of villa residences in Beaumont-road, Bedford Park, for Mr. A. T. Williamson. Mr. Frank Goldring, Theobald's-road, architect :—

Priestley & Gurney	£1,260 0 0
T. Bendon	1,153 15 10
W. T. Niblett	1,111 0 0
Balaam Bros.	1,030 0 0
L. Gassick	1,010 0 0
Parker	1,010 0 0
R. & E. Evans	996 0 0
J. C. Dare	977 9 0
Fowler	975 0 0
Aldridge & Jeuvey	883 16 6

For repairs to court-house, St. Alban's, Herts. Mr. Urban A. Smith, surveyor. Quantities supplied :—

Ireson, Northampton	£500 0 0
Miskin, St. Alban's	470 0 0

For repairs and alterations to premises, Old Kent-road, for Mr. R. Brait :—

Robert Becton, London	£364 0 0

For Deacon's school and master's residence, Peterborough. Mr. J. R. Naylor, architect. Quantities supplied :—

Jones & Co., Gloucester	£2,561 0 0
Furniss, Sibley, & Hill, Peterborough	2,522 0 0
Chattle & Martin, Peterborough	2,493 0 0
Ireson, Northampton	2,204 0 0
Greenfield, Boston	2,205 0 0
Gray, Peterborough	2,192 0 0
Rands & Sons, Wisbech (accepted)	2,106 0 0
Roberts Bros., Stamford	2,100 0 0
Bulling, Ollerton	2,043 0 0
Chapman, Great Grimsby	1,765 0 0

For new fire-brigade station, Faraday-road, North Kensington. Mr. G. Vulliamy, architect. Quantities by Messrs. Nixon & Raven :—

Toser	£9,345 10 0
D. G. Laing & Son	8,789 0 0
Holt	8,440 17 0
Mowlem & Co.	8,150 0 0
Bentley	7,689 0 0
Lucas & Son	7,600 0 0
Reading	7,404 0 0
Tyerman	7,400 0 0
Garrud & Tink	7,231 0 0
Stimpson & Co.	7,212 0 0
Hook	6,957 0 0

For alterations and repairs to the Barley Mow, Dorset-street, Baker-street. Mr. F. W. Hunt, Upper Baker-street, architect. Quantities by Messrs. Vinall & Kennedy, Guilford-street :—

J. & H. Cocks	£802 10 0
W. H. Butcher	673 0 0
Haylock	660 0 0
E. Harris & Sons	657 0 0
Parker	640 0 0

For the erection of a coffee public-house, Midland-road, Wellingborough, for the Coffee-house Company, Limited. Mr. W. Talbot Brown, architect :—

E. Brown	£4,053 0 0
J. Underwood	3,902 0 0
G. Henson (accepted)	3,700 0 0

For new town-hall and offices, Corsham, Wilts. Messrs. Smith & Marshall, Chippenham, architects :—

Bromley, Osborne, & Cole (accepted)	£1,540 0 0

For alterations to a house in Senior-street, for Mr. J. T. Smith. Mr. Frank Goldring, architect :—

Nightingale	£172 0 0
Grover	128 0 0
Aldridge & Jeuvey	81 8 4
Conway	73 10 0

For repairs, &c., at the Prince of Wales, Elizabeth-street, for Mr. Riven. H. I. Newton, 27, Great George-street, architect :—

Badcock	£192 0 0
Simpson	185 0 0
Pickersgill Bros.	157 0 0
Wood (accepted)	142 0 0

For villa residence with stabling, at Westcombe Park, Greenwich, for Mr. Richard Fegan, M.D. Mr. Thomas Dinwiddy, architect :—

Redman	£2,780 0 0
Whittaker	2,670 0 0
Wood	2,568 0 0
Sly	2,554 0 0
Bowdidge & Burley (accepted)	2,400 0 0

For pulling down old premises and erecting three houses in Paradise-place, Cambridge-road. Mr. William C. Livermore, architect :—

Russell	£666 0 0
Mansell	600 0 0
Sills	581 10 0
Poulson	579 0 0
England & Thompson (accepted)	577 0 0

For villa at Woodberry Down, Stoke Newington, for Mr. C. Gatliff. Messrs. F. Percy Harrison, Cooper, & Co., architects. Quantities by Mr. Edwin C. Pinks :—

Burman	£1,269 0 0
Stevens Bros.	1,212 0 0
Scott	1,173 0 0
Harris & Wardrop	1,126 0 0

TO CORRESPONDENTS.

A. T. T. (drawing has not come out satisfactorily. It shall, however, appear before long.)—W. T. (read the specification thus, and what question can there be :—The concrete to be composed as follows : one bushel of cement, two bushels of sand, three bushels of gravel).—J. A. H.—J. T.—A. W.—W. H. L.—W. R. H.—H. & S.—L. & Son.—W. H. P.—C. E.—H. J. N.—T. C.—J. U.—W. S. W.—W. H. B.—J. H.—J. S.—B. C. jun.—T. D.—F. & E.—W. C. L.—H.—F. G.—G. C. D.

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